

INTRA - OFFICE MEMORANDUM

COUNTY OF SAN MATEO
Department of Public Works

March 11, 2005

TO: Jill Boone, Waste Management and Recycling Division

FROM: Bruce E. Kirk, Design and Project Development Division

RE: **Cement and Fly Ash in Concrete**

Attached is a worksheet comparing various codes which allow the use of fly ash in concrete. We used the most current standards and codes available in the Public Works and Stanford libraries.

For structural concrete:

The American Concrete Institute (ACI 318) Manual of Concrete Practice [2004] and Uniform Building Code [1994] state that fly ash can generally be used with portland cement in structural concrete. The "Greenbook" Standard Specifications for Public Works Construction [1994] and Caltrans specifications specify the use of fly ash with only certain types of cement in structural concrete.

For non-structural concrete:

The American Concrete Institute (ACI 303) Manual of Concrete Practice [2004] generally approves the use of fly ash in architectural concrete. However, other references caution fly ash use in mortar, grout or plaster unless approved by the engineer.

Boilerplate Specifications:

We have incorporated the use of fly ash in concrete in the County's boilerplate specification. Section 90 -Portland Cement Concrete of the County's specification is modified with the insertion of the following:

90-5. Fly Ash Requirement

Contractor's attention is directed to the portion of Section 90-2.04, "Admixture Materials" and Section 90-4.08, "Required Used of Mineral Admixtures" of the "**Standard Specification, Section 90: Portland Cement Concrete,**" on file in the office of the Director of Public Works of San Mateo County relating to the use of fly ash in concrete.

Whenever possible, the mineral admixture of fly ash conforming to ASTM Designation: C 618 shall be combined with Type IP(MS) cement conforming to ASTM Designation: C 595 to make cementitious material. Type IP(MS) cement shall be used in place of ASTM C 150 Type II or Type V portland cement where possible.

Type IP(MS) may not be a substitution for ASTM C 150 Type III unless approved by the Engineer.

Special Projects Specifications:

We have also investigated the boilerplates for Special Projects and have determined that the language suggesting the use of fly ash in cement for structural or non-structural cement is adequate. We may wish to suggest that this requirement be highlighted in the Special Projects specifications as consultants are typically used to generate specifications for major projects.

Project Database:

We have included a system for tracking fly ash in our database as they are used on a project.

Cost:

Estimated cost of concrete with fly ash admixture is approximately \$ 100 per CY and is available at the following locations in the Bay Area:

RMC Pacific	Graniterock	Central Concrete
876 Seaport Boulevard	355 Blomquist Street	635 Seaport Boulevard
Redwood City, CA 94063	Redwood City, CA94063	Redwood City, CA 94063
(650) 367-0188	(650) 482-3838	(650) 363-0944

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Enclosure: As stated

cc: Don Williams, Waste and Environmental Services Manager
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