

**EFFECTS OF HIGH-LIME FLY ASH CONTENT ON WATER DEMAND,
WORKABILITY, TIME OF SET AND COMPRESSIVE STRENGTH OF
CONCRETE EARLY AGE STRENGTH DETECTION FOR IN-SITU
CONCRETE**

By Tarun R. Naik

Reference: CBU-1989-05

ABSTRACT

A laboratory investigation was carried out to evaluate early-age strength of concrete using maturity test method. A total of six different concrete mixtures were produced. The water to cement ratio by weight was varied between 0.46 and 0.55. Four of these mixtures were made with 19 mm maximum size aggregates and the other two were made with 25 mm maximum size aggregates. The concrete temperature varied between 16.1 C and 17.2 C; the slump varied between 70 mm and 194 mm; the air content varied between 2.1% and 7.5%; and, concrete density varied between 2268 kg/m³ and 2508 kg/m³. The maturity values were recorded by a maturity meter that was based on the Nurse-Saul equation. Additionally, maturity was also computed by measuring temperature of test specimens. The results showed that in-place compressive strength and tensile strength at early ages could be reliably determined by using the maturity method. The effects of water to cement ratio, size of aggregates, and amount of air entrained did not significant affect the relationships between the maturity and strength properties of concretes within the tested range.