This paper presents the results of an experimental investigation carried out to investigate the effects of ponded-ash on the properties of non-air entrained and air-entrained concrete. Total of nine concrete mixtures were produced; three concrete mixtures were non-air entrained concrete; three mixtures were non-air entrained with HRWRA, and three were air entrained concrete mixtures. Percentage of ponded-ash varied from 22 to 35% of cementitious materials in non-air entrained concrete and 17 to 20% in air-entrained concrete. All concrete mixtures also contained 5% ponded-ash as percentage replacement of total aggregates. Control mixtures of non-air entrained concrete and non-air entrained concrete with HRWRA were proportioned to attain 28-day compressive strength of 5000 psi, whereas as the control mixture of air-entrained was proportioned to achieve strength of 4000 psi at 28 days. Tests were performed for fresh concrete properties, and of compressive strength, splitting tensile strength, flexural strength, abrasion resistance, drying shrinkage, etc. up to 180 days of testing.

Based on the tests results it was concluded that non-air entrained concrete mixtures can successfully incorporate up to 25% ponded-ash, whereas air-entrained concrete mixtures can be made with up to blends of 20% ponded-ash and 5% Class F fly ash.