Evaluation of Liquefaction Potential of Impounded Fly Ash

Behrad Zand[1], Wei Tu[1], Pedro Amaya[2], William E Wolfe[1], Tarunjit S. Butalia[1]

1. Department of Civil and Environmental Engineering and Geodetic Science, The Ohio State University, 470 Hitchcock Hall, 2070 Neil Avenue, Columbus, Ohio, 43210.
2. American Electric Power, One Riverside Plaza 22nd floor, Columbus, OH 43215.

Key Words: Impounded Fly Ash, Liquefaction Potential, Dynamic Triaxial Test

Abstract
An experimental and analytical investigation of the liquefaction potential of Class F fly ash is presented. The fly ash, originally placed in a 112 acre impoundment varied in depth from about 50 to 180 feet. The proposed use for the ash was as a base for a utility monofill. The evaluation included cyclic triaxial tests performed on reconstituted fly ash samples at relative densities, confining stresses, and cyclic stress ratios representative of the impounded material and the seismic environment. Post-liquefaction strengths were measured by reconsolidating the samples at the initial effective confining stress and performing consolidated undrained (CU) triaxial tests on each sample. The measured cyclic strength was compared with the seismically induced stresses in the profile using the well known one dimensional wave propagation program SHAKE. The cyclic loading imposed on the ash by the design earthquakes was found to be lower than the cyclic strength of the fly ash material.

Submitted for the consideration in the World of Coal Ash 2007 Conference, held May 7-10, 2007.