2-D Nonlinear Finite Element Analysis of Folsom Dam: Seismically Induced Separation and Pore Pressure along the Soil-Concrete Interface

Adam Kaplan, Ph.D., Kennesaw State University

Adam Kaplan, Kennesaw State University

Grace Amoussou, Kennesaw State University

The seismic soil-concrete interface stability of composite dams has been an area of interest to many researchers. However, the true interface behavior during a seismic event has not been well understood. During a ground shaking, bonding and de-bonding action along the interface may cause significant separation of soil and concrete surfaces, and such a separation may take place at any depth along the interface creating a stability concern for the overall dam. Moreover, the repetitive nature of bonding/debonding behavior may induce excess pore pressure along the interface, which in turn, may trigger a liquefaction failure or a hydraulic fracture in the soil. This study evaluates the potential for seismically induced separation and excess pore pressure at the soil-concrete interface of Folsom Dam - located north-east of Sacramento, CA - using 2D Finite Element analysis software, GesoStudio-Quake/ W. The separation and excess pore pressure distributions along the interface are investigated using linear and nonlinear constitutive models with pore pressure generation capability. Findings are compared to the similar work published by other researchers.