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Comparison of Accumulated Stress Based Pore Pressure Model and Plasticity Model in 1D Site Response Analysis

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Abstract : This paper presents the comparison of excess pore water pressure ratio (ru) predicted by using accumulated stress based pore pressure model and plasticity model. One dimensional effective stress site response analyses were performed on a 30 m deep sand column (consists of a liquefiable layer in between non-liquefiable layers) using accumulated stress based pore pressure model in Deepsoil and PDMY2 (PressureDependentMultiYield02) model in Opensees. Three Input motions with different peak ground acceleration (PGA) levels of 0.357 g, 0.124 g, and 0.11 g were used in this study. The developed excess pore pressure ratio predicted by the above two models were compared and analyzed along the depth. The time history of the ru at mid of the liquefiable layer and non-liquefiable layer were also compared. The comparisons show that the two models predict mostly similar ru values. The predicted ru is also consistent with the PGA level of the input motions.

Keywords : effective stress, excess pore pressure ratio, pore pressure model, site response analysis
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