

Finite Element Analysis of the Ordinary Reinforced Concrete Bridge Piers

Authors : Nabin Raj Chaulagain

Abstract : Most of the concrete bridges in Nepal constructed during 90's and before are made up of low strength ordinary concrete which might be one of the reasons for damage in higher magnitude earthquake. Those bridges were designed by the outdated bridge codes which might not account the large seismic loads. This research investigates the seismic vulnerability of the existing single column ordinary concrete bridge pier by finite element modeling, using the software Seismostruct. The existing bridge pier capacity has been assessed using nonlinear pushover analysis and performance is compared after retrofitting those pier models with CFRP. Furthermore, the seismic evaluation was made by conducting cyclic loading test at different drift percentage. The performance analysis of bridge pier by nonlinear pushover analysis is further validated by energy dissipation phenomenon measured from the hysteric loop for each model of ordinary concrete piers.

Keywords : finite element modeling, ordinary concrete bridge pier, performance analysis, retrofitting

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