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TWO-LEVEL SEISMIC DESIGN METHOD USING POST-YIELD STIFFNESS AND ITS APPLICATION TO UNBONDED BAR REINFORCED CONCRETE PIERS

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The two-level seismic design method using post-yield stiffness is proposed. The post-yield stiffness on the load—displacement relationship of the RC pier is found to be effective for the reduction of both the demand strength and the residual displacement under extreme earthquakes. Then, the two-level seismic design method is applied to the Unbonded Bar Reinforced Concrete (UBRC) pier that has the stable post-yield stiffness. The smaller cross section is designed than the optimal cross section of the conventional RC structure. The performance of the UBRC pier is verified by the pseudodynamic tests, and as the results it is confirmed that the UBRC piers can be rationally satisfied with the required performance of the two-level seismic design.

Key Words: post-yield stiffness, two-level seismic design, UBRC structure, small section pier

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