

The Structural System Concept of Reinforced Concrete Pier Accompanied with Friction Device plus Gap in Numerical Analysis

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Abstract : The problem of medium span bridge bearing support in the extreme temperatures fluctuation region is deterioration in case the suppression of superstructure that sustains temperature expansion. The other hand, the behavior and the parameter of RC column accompanied with friction damping mechanism were determined successfully based on the experiment and numerical analysis. This study proposes the structural system of RC pier accompanied with multi sliding friction damping mechanism to substitute the conventional system of pier together with bearing support. In this system, the pier has monolith behavior to the superstructure with flexible small deformation to accommodate thermal expansion of the superstructure. The flexible small deformation behavior is realized by adding the gap mechanism in the multi sliding friction devices form. The important performances of this system are sufficient lateral flexibility in small deformation, sufficient elastic deformation capacity, sufficient lateral force resistance, and sufficient energy dissipation. Numerical analysis performed for this system with fiber element model. It shows that the structural system has good performance not only under small deformation due to thermal expansion of the superstructure but also under seismic load.

Keywords : RC Pier, thermal expansion, multi sliding friction device, flexible small deformation

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