

Experimental study of impact loading effect on bridge substructures including piles

ABSTRACT

One of the main reasons of bridge substructure's collapse is due to vehicular collision to its support, specifically columns, and as of now, there is a lack of understanding on the inter-relation between columns and piles when subjected to impact load. As such, the major purpose of this investigation was to study the behaviour of concrete columns under vehicular collision (impact load) and assess the stresses distributed to piles due to collision. Experimental tests were performed by conducting pendulum impact tests on scaled down concrete specimens. The findings of the study showed an expected behaviour in terms of peak displacement along the columns where the displacement reduced as the size of the columns increased. Furthermore, increasing the column size also reduced the load transferred to the piles during vehicular collision.

Keyword: Impact load; Bridge; Concrete; Piles