

Experimental Investigation on Performance of Beam Column Frames with Column Kickers

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Abstract : The worldwide use of reinforced concrete construction stems from the wide availability of reinforcing steel as well as concrete ingredients. However, concrete construction requires a certain level of technology, expertise, and workmanship, particularly, in the field during construction. As a supporting technology for a concrete column or wall construction, kicker is cast as part of the slab or foundation to provide a convenient starting point for a wall or column ensuring integrity at this important junction. For that reason, a comprehensive study was carried out here to investigate the behavior of reinforced concrete frame with different kicker parameters. To achieve this objective, six half-scale specimens of portal reinforced concrete frame with kickers and one portal frame without kicker were constructed according to common practice in the industry and subjected to cyclic incremental horizontal loading with sustained gravity load. In this study, the experimental data, obtained in four deflections controlled cycle, were used to evaluate the behavior of kickers. Load-displacement characteristics were obtained; maximum loads and deflections were measured and assessed. Finally, the test results of frames constructed with three different types of kicker thickness were compared with the kickerless frame. Similar crack patterns were observed for all the specimens. From this investigation, specimens with kicker thickness 3" were shown better results than specimens with kicker thickness 1.5", which was specified by maximum load, stiffness, initiation of first crack and residual displacement. Despite of better performance, it could not be firmly concluded that 4.5" kicker thickness is the most appropriate one. Because, during the test of that specimen, separation of dial gauge was needed. Finally, comparing with kickerless specimen, it was observed that performance of kickerless specimen was relatively better than kicker specimens.

Keywords : crack, cyclic, kicker, load-displacement

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