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Use of Regression Analysis in Determining the Length of Plastic Hinge in Reinforced Concrete Columns

Authors : Mehmet Alpaslan Köroğlu, Musa Hakan Arslan, Muslu Kazım Körez

Abstract : Basic objective of this study is to create a regression analysis method that can estimate the length of a plastic hinge which is an important design parameter, by making use of the outcomes of (lateral load-lateral displacement hysteretic curves) the experimental studies conducted for the reinforced square concrete columns. For this aim, 170 different square reinforced concrete column tests results have been collected from the existing literature. The parameters which are thought affecting the plastic hinge length such as cross-section properties, features of material used, axial loading level, confinement of the column, longitudinal reinforcement bars in the columns etc. have been obtained from these 170 different square reinforced concrete column tests. In the study, when determining the length of plastic hinge, using the experimental test results, a regression analysis have been separately tested and compared with each other. In addition, the outcome of mentioned methods on determination of plastic hinge length of the reinforced concrete columns has been compared to other methods available in the literature.

Keywords : columns, plastic hinge length, regression analysis, reinforced concrete
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