

Experimental Study on Single Bay RC Frame Designed Using EC8 under In-Plane Cyclic Loading

Authors : N. H. Hamid, M. S. Syaref, M. I. Adiyanto, M. Mohamed

Abstract : A one-half scale of single-bay two-storey RC frame together with foundation beam and mass concrete block is investigated. Moment resisting RC frame was designed using EC8 by including the provision for seismic loading and detailing of its connection. The objective of the experimental work is to determine seismic behaviour RC frame under in-plane lateral cyclic loading using displacement control method. A double actuator is placed at centre of the mass concrete block at top of frame to represent the seismic load. The percentage drifts are starting from $\pm 0.01\%$ until $\pm 2.25\%$ with increment of $\pm 0.25\%$ drift. The ultimate lateral load of 158.48 kN was recorded at $+2.25\%$ drift in pushing and -126.09 kN in pulling direction. From the experimental hysteresis loops, the parameters such as lateral strength capacity, stiffness, ductility and equivalent viscous damping can be obtained. RC frame behaves in the elastic manner followed by inelastic behaviour after reaches the yield limit. The ductility value for this type frame is 4 which lies between the limit 3 and 6. Therefore, it is recommended to build this RC frame for moderate seismic regions under Ductility Class Medium (DCM) such as in Sabah, East Malaysia.

Keywords : single bay, moment resisting RC frame, ductility class medium, inelastic behavior, seismic load

Conference Title : ICESE 2015 : International Conference on Earthquake and Structural Engineering

Conference Location : Melbourne, Australia

Conference Dates : December 13-14, 2015