

ESTIMATE METHOD OF SHEAR STRENGTH OF REINFORCED CONCRETE COLUMNS WITH SIDEWALL

Structural performance of RC columns with sidewall strengthened by polymer-cement mortar Part I

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In conventional cast-in-place reinforced concrete (RC) buildings in Japan, RC frames and cast-in-place non-structural RC walls (mullions, spandrels and sidewalls) are constructed simultaneously and are connected rigidly. This paper suggests a seismic retrofitting technique that makes the most of cast-in-place RC sidewalls for existing RC columns by applying polymer-cement mortar (PCM). In the technique, additional shear reinforcement (hoops of column and/or horizontal shear reinforcement of sidewall; prefabricated reinforcing unit) is adhered to the surfaces of existing RC columns with RC sidewall by applying PCM. The strengthened area (additional reinforcement and PCM) and existing member are strongly joined by the high adhesive strength of the PCM, so post-installed anchors need not be used in this technique. Shear-loading tests of the RC columns with RC sidewall were conducted to clarify the structural performance of the columns with sidewall strengthened by PCM. The results suggest that the technique improves the shear capacity and ductility of the RC columns with RC sidewall, and clarified the mechanism of shear resistance of the strengthened columns with sidewall. Furthermore, a method of estimating the capacity (shear strength) of RC columns with RC sidewall strengthened by polymer-cement mortar was proposed by modeling the shear resistance mechanism.