

14. Development of RC Columns Using PCa Shell by Cast Molding - Part 2 Bond Splitting Strength of Main Reinforcement -

Hiroshi Hosoya, Yoshinobu Asano, Masanori Kono,
Yoshio Ogawa, Takashi Uenishi

Construction method of reinforced concrete column using precast shell which functions as the form and a part of the column member was developed, for the purpose of speed and conservation in the construction of an R/C building.

On the development of the method, monotonous tension loading tests of main reinforcement of column members and horizontal cyclic loading tests of column members using PCa shell were carried out with bond splitting strength being examined. The results can be summarized as follows.

- i) There was no substantial difference in bond splitting strength of main reinforcement owing to a difference in the shape and dimension between a rectangle type shear cotter and a checker board type shear cotter.
- ii) Bond splitting strength of main reinforcement with sub-hoop increased approximately 1.2 times than that without sub-hoop.
- iii) If shear cotter area ratio was approximately 0.35~0.4, bearing failure and shear failure was not noted in the placing joint and the bond splitting strength of main reinforcement was the same as a conventional R/C column.
- iv) An equation for bond splitting strength that was based on the equation for bond splitting strength of the Design Guidelines for Earthquake Resistant Reinforced Concrete Buildings Based on Inelastic Displacement Concept was proposed that had a variable safety coefficient on lower limit and intermediate values. With monotonous tension loading and horizontal cyclic loading, lower limit value and intermediate value of bond splitting strength of main reinforcement can be evaluated respectively by this proposed equation.

Key words: reinforced concrete, precast shell, loading test, bond splitting strength, equation for bond splitting strength