

Experimental Study on Strengthening Systems of Reinforced Concrete Cantilever Slabs

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Abstract : There are many problems related to cantilever slabs such as the time-dependent deformation, corrosion problems of steel reinforcement, and lack of experimental studies on the strength of strengthened cantilever slabs. This paper presents an investigation to evaluate the behavior of reinforced concrete cantilever slabs after strengthening with different techniques. Six medium scale specimens, divided into three groups, were tested along with a control slab. The first group consists of two specimens which were repaired and strengthened using reinforced concrete jacket above with and without shear connector bars, whereas the second group contained two slabs which were strengthened using two strips of two layers of glass fiber reinforced polymer (GFRP) covering 60% and 90% from the cantilever length. The last group involves two specimens strengthened with two steel plates. In one specimen, the steel plates were glued to the surface using epoxy resin. The second specimen, the steel plates were affixed to the concrete surface using expansion bolts. The loading was conducted in two phases. Firstly, the samples were subjected to 40% of the ultimate load of the control slab. Secondly, the specimens reloaded after being strengthened up to failure. The load-deflection, steel strain, concrete strain, failure mode, toughness, and ductility index are discussed in this paper.

Keywords : repair, strengthened, GFRP layers, reloaded, jacketing, cantilever slabs

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