

COMPOSITE STRENGTHENING SOLUTIONS FOR REINFORCED CONCRETE LOAD BEARING ELEMENTS

Nicolae ȚĂRANU¹, Ioana Sorina ENȚUC²,
Gabriel OPRÎȘAN³, Vlad MUNTEANU⁴,
Mihai BUDESCU⁵, Ruxandra COZMANCIUC⁶

Rezumat. În lucrare se prezintă rezultatele unui program complex de cercetare-dezvoltare referitor la aplicarea soluțiilor de consolidare bazate pe compozite polimerice armate cu fibre, organizat la Facultatea de Construcții și Instalații din Iași. Programul a inclus concepția sistemelor de reabilitare structurală, alcătuirea constructivă și testarea experimentală a unor soluții aplicate la grinzi, plăci și stâlpi (cu secțiune circulară și pătrată). În cazul fiecărui element portant s-a urmărit utilizarea eficientă a materialelor pentru creșterea performanțelor structurale ale elementelor din beton armat, concretizate prin creșterea eforturilor capabile, îmbunătățirea răspunsului structural și controlul modurilor de rupere.

Abstract. The results of a complex research and development program relating to the use of fiber reinforced polymeric composite strengthening solutions carried out at the Faculty of Civil Engineering and Building Services Iasi, are presented in this paper. The program has included the conceiving of the structural rehabilitation systems, the detailing and experimental testing of some solutions applied to reinforced concrete beams, slabs and columns (with circular and square cross-section). An efficient use of the component materials to improve the structural performance of the studied reinforced concrete element has been the main target of the research program. The main benefits resulted from the research program refer to the increase of the load capacities, the improvement of the structural response of all strengthened elements and a better control of the failure modes.

Keywords: polymeric composites, structural rehabilitation, beams, slabs, columns

¹Professor, Faculty of Civil Engineering and Building Services, “Gheorghe Asachi” Technical University of Iasi, Romania, full member of the Academy of Romanian Scientists, (taranu@ce.tuiasi.ro).

²Senior Lecturer, Faculty of Civil Engineering and Building Services, “Gheorghe Asachi” Technical University of Iasi, Romania, (entuc@ce.tuiasi.ro).

³Associate Professor, Faculty of Civil Engineering and Building Services, “Gheorghe Asachi” Technical University of Iasi, Romania, (oprisan@ce.tuiasi.ro).

⁴Lecturer, Faculty of Civil Engineering and Building Services, “Gheorghe Asachi” Technical University of Iasi, Romania, (munteanu@ce.tuiasi.ro).

⁵Professor, Faculty of Civil Engineering and Building Services, “Gheorghe Asachi” Technical University of Iasi, Romania, (budescu@ce.tuiasi.ro).

⁶Assistant Lecturer, Faculty of Civil Engineering and Building Services, “Gheorghe Asachi” Technical University of Iasi, Romania, (cozmanciuc@ce.tuiasi.ro).