

# Influence of bonded length of the Carbon Fiber Reinforced Polymer Plates on the behavior of a concrete beam

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## Abstract

*Sometimes Aged or Damaged Structures need to be reinforced and retrofitted to enhance their performances and structural life, for this reason, the rehabilitation has been the subject of extensive research. The strengthening Reinforced Concrete (RC) structures is one of the most difficult and important tasks of civil engineering. Among the ways used to strength the concrete; the reinforcement using Carbon fiber reinforced polymer. This material has proved to be more efficient than other composites because of its high elastics modulus, its durability and this kind of materials are less affected by corrosive environmental conditions. The technique used in this study will be the external bonding of Carbon fiber reinforced polymer (CFRP) to a concrete beam. In this paper, the focus will be on the influence of bonded length of the CFRP Plates on the global behavior of the beam. The study is developed by the finite element program ABAQUS and will contain 11 specimens with a dimension of 100\*200\*1000mm and the length of the CFRP will be 100 mm, 200 mm, 300 mm, 400 mm, 500 mm, 600 mm, 700 mm, 800 mm, 900 mm, and a fully reinforced beam. Numerical results are presented and discussed herein.*

**Keywords: External reinforcement, Concrete behavior, bonded length of CFRP, Abaqus, Stiffness.**