

# The Effect of Applying Carbon Fiber Reinforced Polymer Cords on Reinforced Concrete Columns

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## **Abstract:**

In the field of construction, reinforced concrete (RC) column is fundamental element that hold significant importance as essential load-bearing constituents. In some cases, there is need to strength and enhance load carrying capacity of the column for many reasons such as structural upgrades, aging and deterioration and seismic retrofitting. Using some strengthening and retrofitting techniques can reduce risk damage, increase the load capacity and raise the ductility. One of them is applying flexible near surface mounted –carbon fiber reinforced polymer (NSM-CFRP) cord.

This study will discuss this technique which is used by making grooves in the concrete cover and apply the desired material in, (CFRP will be used here), to examine the effects of used material on the strength of columns, which is a composite material comprising high-strength carbon fibers embedded in a polymer matrix. Analysis and investigation were conducted on strengthened (RC) column sample using CFRP cords from experimental test and comparing results with finite element (F.E) method using Abaqus program. The outcomes show good agreement of results between the proposed (F.E) model and the experimentally repaired columns. The parametric study in this research will include: different shapes of cross-sectional area of the column, classification of column short and long and the effect of applying CFRP on these types of (R.C) column.