

Numerical Simulation of Structural Behavior of NSM CFRP Strengthened RC Beams Using Finite Element Analysis

Authors : Faruk Ortes, Baris Sayin, Tarik Serhat Bozkurt, Cemil Akcay

Abstract : The technique using near-surface mounted (NSM) carbon fiber-reinforced polymer (CFRP) composites has proved to be an reliable strengthening technique. However, the effects of different parameters for the use of NSM CFRP are not fully developed yet. This study focuses on the development of a numerical modeling that can predict the behavior of reinforced concrete (RC) beams strengthened with NSM FRP rods exposed to bending loading and the efficiency of various parameters such as CFRP rod size and filling material type are evaluated by using prepared models. For this purpose, three different models are developed and implemented in the ANSYS® software using Finite Element Analysis (FEA). The numerical results indicate that CFRP rod size and filling material type are significant factors in the behavior of the analyzed RC beams.

Keywords : numerical model, FEA, RC beam, NSM technique, CFRP rod, filling material

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