

عنوان مقاله:

Simulation of the Behavior of Corrosion Damaged Reinforced Concrete Beams with/without CFRP Retrofit

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خلاصه مقاله:

Harsh environmental conditions along with aggressive chemical agents are known as one of the main reasons behind damages observed in reinforced concrete members. Corrosion of reinforcement worldwide is one of the leading causes of damages occurred in reinforced concrete over the lifespan. There are many critical energy and transportation infrastructures located on coastal regions exposed to high humidity and chloride content where they are highly prone to reinforcement corrosion. This calls for retrofit methods, which safeguard not only the strength but also the durability of corrosion deteriorated reinforced concrete structures. Carbon fiber polymers considering their mechanical and chemical properties are recognized as one of the main retrofit techniques. In this study, the influence of different levels of corrosion on the structural behavior of reinforced concrete beams is studied. ABAQUS software package is employed to simulate the nonlinear behavior of reinforced concrete beams with tensile reinforcements and stir-ups corrosion degrees of 20% and 40%. The structural behavior of original damaged specimen as well as the same specimen strengthen with carbon fiber reinforced polymer (CFRP) is studied. The purpose of the retrofit is compensate for the loss of shear and flexural capacity of the member due to corrosion. Different variants for the arrangement of CFRP strips are studied and compared. The result of the current research further uncaps the efficiency of fiber polymers to secure strength and durability of corrosion damaged reinforced concrete members.

کلمات کلیدی:

(Retrofit; Reinforcement Corrosion; Reinforced Concrete Beam; Carbon Fiber Reinforced; Polymer (CFRP

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