

عنوان مقاله:

Study of Post-Spalling Reinforced Concrete Beam Repair Using Grouting and GFRP Reinforcement

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خلاصه مقاله:

Reinforced concrete beams must meet strength and durability standards, but aggressive environmental factors are the main cause of corrosion, which can affect the strength and durability of building structures. Maintenance, retrofitting, and reinforcement of structures are important to ensure safety. It is necessary to take appropriate measures to address corrosion problems in building structures early on. One way to achieve this is by repairing damaged structures using more modern and effective technologies and materials. This study aims to determine the flexural behavior of reinforced concrete (RC) beams repaired with Sikagrout-۲۱۵ material and reinforced with GFRP sheets with different layer configurations. The study used three RC beams as the control group, three RC beams coated with Sikagrout-۲۱۵ mortar, and six RC beams reinforced with GFRP. All beams were subjected to ۴-point bending tests to determine their load capacity, crack response, ductility, and energy absorption capacity. The results showed that repair with grouting decreased the load capacity, while reinforcement with a combination of mortar grouting and GFRP increased the maximum load. Reinforcement of the support region could restore the function of the beam by ۹.۳%. Among the three types of reinforcement, BGRST significantly improved the first crack response, yield response, and ultimate performance of the RC beams. Beam fracture occurred more frequently with Sikagrout-۲۱۵ mortar reinforcement, while reinforcement with GFRP composites partially protected the load capacity after fracture. Doi: ۱۰.۲۸۹۹۱/CEJ-۲۰۲۴-۰۱۰-۰۱-۰۸ Full Text: PDF

کلمات کلیدی:

Reinforced Concrete; Spalling; Grouting; GFRP

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