

FLEXURAL CAPACITY ANALYSIS OF REINFORCED CONCRETE BEAMS AFTER RETROFIT USING REPAIR MORTAR STRUCTURAL

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ABSTRACT

Damage caused by spalling in the tensile zone can reduce the flexural capacity of reinforced concrete beams. This study aims to analyze the effect of retrofitting using Structural Repair Mortar on the flexural capacity and crack patterns of reinforced concrete beams. The experimental study was conducted on beams measuring 150 mm × 200 mm × 1400 mm, consisting of a control beam (BK), a spalling beam (BS), and retrofitted beams (BM). The results showed that the BS had an ultimate moment of 3.71 kN·m, the BK had an average ultimate moment of 18.97 kN·m, while the BM had an average ultimate moment of 19.64 kN·m. Thus, retrofitting increased the flexural capacity by 429% compared with the BS and by 3.56% compared with the BK. At first cracking, the BM had an average load of 56.9 kN and a cracking moment of 12.80 kN·m, higher than the BK, which had 37.2 kN and 8.37 kN·m, respectively, while the BS had only 14.8 kN and 3.33 kN·m. All three beam conditions exhibited flexural crack patterns and flexural failure. These results indicate that Structural Repair Mortar can improve the flexural capacity of spalling-damaged reinforced concrete beams, bringing their capacity close to and slightly above that of the control beam.

Keywords: *Beam Retrofit, Repair Mortar Structural, Bottom Chiseling, Flexural Capacity, Non-Shrink Grout*