

BI 01 Novel technique for slab repair and its static behavior

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Mechanical repair is widely adopted to repair and retrofit corroded structures. In mechanical repair, shotcreting is commonly used as the repair technique and, instead of concrete, especially design repair mortar with improved mechanical properties are generally used as repair material. We investigate a possible novel technique of repairing slabs subjected to corrosion. The objective of this research is to develop and compare the structural performance of new repair technique with mechanical repair. Repair length, strength of the repair concrete and type of static loading were considered as variables. To investigate influence of the length of repair, specimens with 50% and 80% of the span repaired in the tension phase were used. Two concrete strengths, grade 40 and grade 70 were used in the study to find the influence of strength of repair on the structural behavior of repaired slabs. Although slabs are lesser shear intensive, slabs were tested for two shear span to depth ratios to evaluate performance of repair under intensive shear loading. It is found that the novel technique which involved pouring self-compacting concrete under gravity to cavity created underneath the existing slab deck is as effective as conventional method. It is evident that new repair can restore the composite action and static performance. However under heavy shear loading, it is noted that some of the repaired beams especially with 80% repair length have developed into shear failure and have recorded delamination of the repair from the parent concrete. And also found that 50% repair is more effective than 80% repair and higher concrete grade is more effective in restoring the structural behavior of repaired beams. Any comparing the results of novel technique with conventional repair it can be safely concluded that the new repair method is an effective as the conventional technique for repairing corrosion damages.

Keywords: self-compacting concrete, mechanical repair, shotcreteing, corrosion of reinforcement