

# **Evaluation of repair materials with emphasis on crack injection repair**

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August 1990

## **Abstract**

This study addresses three aspects of repair which are very essential in the Arabian Gulf climatic conditions. Firstly, evaluation of deterioration in the quality of adhesion and bond between repair material and parent concrete due to thermal incompatibility. Secondly, evaluation of the relative effectiveness of a range of crack injection materials for the repair of live cracks. Thirdly, development of a pulse velocity technique and standards for evaluation of crack injection repair.

To evaluate deterioration of adhesion due to thermal incompatibility two types of repair techniques were used: reinstatement of section and dead crack repair. A total of ten types of cementitious and resinous repair materials were used for reinstatement of the section and seven cementitious and resinous materials for the repair of two dead crack widths (2.0mm and 0.75mm). The test specimens were subjected to 60 and 90 thermal cycles to simulate a typical summer day in the Gulf region for an evaluation of bond deterioration due to heat cycling.

In the evaluation of live crack repair two crack widths of 2mm and 0.5mm were repaired using six cementitious and resinous repair materials. A modified repair technique was developed and evaluated with two of the repair materials.

For quality assurance of crack injection repair, Direct and Indirect pulse velocity methods were evaluated for three crack dimensions to covering a range of crack configurations using both 200 and 500 KHZ transducers.