CONCRETE REPAIR ASSOCIATION

Setting high standards of workmanship and technical competence

## NEWS RELEASE 119

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# BRAND NEW ADVICE NOTE FROM THE CRA

Corrosion of steel reinforcement in concrete is the single largest cause of deterioration of the UK's infrastructure.

The environment provided by good quality concrete, in which steel reinforcement exists, is said to be 'passive', whereby a highly dense and protective oxide film forms on the steel's surface. The concrete pore solution is highly alkaline owing to the presence of hydroxides produced during hydration reactions. Any small breaks in this protective oxide film are constantly repaired by the hydroxyl ions. Furthermore, the cover concrete acts as a physical barrier to aggressive agents.

If, however, the alkalinity of the surrounding concrete is reduced, such as by neutralisation with atmospheric carbon dioxide or if depassivating ions such as chlorides are able to reach the steel, then corrosion of the reinforcement can occur.

The two primary reasons for the deterioration are *carbonation* (which leads to the loss of concrete alkalinity) and *chloride attack* primarily from de-icing agents or seawater (which break down the protective oxide film of the steel reinforcement). The presence of moisture and oxygen can cause expansive corrosion up to eight times greater than the original steel product. These expansive forces are sufficient to cause concrete cracking, delamination and eventually spalling.

To explain the condition and the various remedial options that are available, the UK **Concrete Repair Association (CRA)** has recently published an entirely new publication entitled 'Electrochemical rehabilitation of steel reinforced concrete structures' - Advice Note No. 4.

It is specifically designed for the benefit of specifiers, contractors and owners of structures/buildings containing concrete components who need a brief explanation of the methods and just as importantly, the critical matters to be taken into account when looking at specific projects.

The document covers design considerations and outlines possible electrochemical remedial solutions, such as realkalisation, chloride extraction, cathodic protection/prevention and sacrificial systems, as well as describing new developments.

'Electrochemical rehabilitation of steel reinforced concrete structures' - Advice Note No. 4, can be downloaded, free of charge, at: www.cra.org.uk Alternatively, hard copies can be requested. Tel: 01420 471615, or e-mail at: publications@cra.org.uk

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