

# **NCC's Concrete Repair Site –**

**[www.ConcreteRepairSite.co.uk](http://www.ConcreteRepairSite.co.uk)**

## **X). Cracked Concrete Repairs by Resin Injection of the Cracks.**

Cracks in concrete buildings and other structures must always be inspected by the responsible Structural Engineer before the concrete repair and protection works begin. The precise nature / reason for the crack, together with its full extent and any structural or other significance must first be determined.

From this structural assessment, which is usually undertaken as part of the Condition Survey and Diagnostic Assessment the most appropriate remedial solution such as resin injection can be specified and incorporated into the schedule of the overall concrete repair and protection works.

### **Resin Injection to Repair Non–Structural Cracks in Concrete.**

If the crack in the reinforced concrete is due to past movement or excessive loading applied to the element or the structure as a whole i.e. during the original construction, work, or the installation of heavy equipment for example; then it may well have no structural significance.

When the structural engineer confirms that it is no longer moving then it may simply be filled with an appropriate repair or surface levelling mortar and overcoated to prevent the ingress of aggressive liquids or gases i.e. with the same protective coating as the rest of the surface. However if it is possible that at least some thermal or other slight movement could occur in the future, causing the crack to open again, then the crack can be structurally re-bonded with a suitable low pressure epoxy injection resin for example, or at least a crack bridging coating should be used.

Where the crack has no structural significance but is definitely subject to significant thermal or other movement, then a suitable crack bridging surface coating should always be used or dependent on its size and location, the crack may be transferred and treated as a movement joint in the surface i.e. formed to the correct size, brought through to the surface and sealed with an elastic joint sealant such as Sikaflex Construction.

European Standard EN1504 Part 9 Principle 1 (Protection Against Ingress) Method 1.2 Surface Coating with Crack-Bridging Ability; Method 1.3 Locally Bandaged Cracks; Method 1.4 Filling Cracks; and Method 1.5 Transferring into Joints – Can all apply as appropriate to the structure's situation and requirements.

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## **Resin Injection of Structural Cracks in Concrete.**

When a crack has structural significance then provided that the responsible Structural Engineer is satisfied that the source of the damage i.e. excessive load imposed by extraordinary circumstances during the construction process or other unique event, has been removed, then the crack can be structurally re-bonded using epoxyresin injection techniques, or by 'stitching' with additional bonded steel dowel bars as reinforcement.

Alternatively if the crack has led to, or been caused by other significant or larger voids such as areas of honeycombing or inadequate compaction around reinforcement or other details or penetrations through the concrete, then these should be filled with an appropriate cement or resin based grout. Alternatively the whole area of damage should be cut out and repaired with a suitable repair mortar as replacement concrete.

In all structural resin injection situations we recommend that the work is carried out using modern low pressure techniques and a resin with an extended 'pot-life' to allow a longer period for the material to penetrate and fill all areas of the cracks. This is to prevent the risk of ancillary structural damage that can be caused by less controllable high pressure resin injection systems, similarly to prevent contamination outside of the structure with resins or other materials during the process. There are special resin injection materials that are suitable and approved for use in contact with potable (drinking) water, plus materials that can accommodate, or even displace any water in the cracks within the structure.

The correct resin injection process can fully restore structural integrity to cracked areas or sections of reinforced concrete and ensure long term durability, with an extended service life of the structure.

European Standard EN1504: Part 9 Principle 4 (Structural Strengthening) Method 4.5 Injecting Cracks, Voids or Interstices; and Method 4.6 Filling Cracks, Voids or Interstices – Can apply according to the specific requirements of the individual structure and the nature of the cracks.

**Once again, NCC is also one of the UK's leading Materials and Consultants and Distributors for resin injection and cement grouting products. Therefore for specific advice on your project injection or grouting requirements please contact any of our offices and one of our specialists will be pleased to assist you.**

As with other structural strengthening works, resin crack injection should only be carried out by trained and experienced contractors after qualified structural investigation and analysis. However we do stock and sell a whole range of Epoxy

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Resin Grouts and Resin Anchors / Resin Adhesives that are used for many different structural and non-structural bonding and fixing jobs and these are available here in our Online Shop.