Concrete Slab Stabilisation

Vacuum Void Grouting

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Extending the life of rigid pavements using vacuum assistance.

Overview

Vacuum Void Grouting is specifically designed to enable the controlled introduction of resin grout to fill small voids beneath the joints of rigid pavements thus stabilising and supporting the construction.

It is now over 40 years since the first feasibility trial was conducted on Western Avenue, (A40), East Acton, London, during a night closure on 10 January 1977. In that time Balvac have refined the process, including testing, and numerous successful contracts have been undertaken throughout the UK.

Advantages

Advantages of the technique include having controlled resin flow from the use of vacuum which minimises the potential for damage to underground services. No unwanted lifting forces are generated, so there is no need to cease injection before the void is filled. The rapid curing of the grout enables the road to be opened to traffic within an hour. The specialist plant is highly mobile allowing maximum utilisation of lane closures between peak traffic flows and full use of the carriageway during busy periods or in an emergency. Its versatility means that it doesn't only apply to roads. The life of concrete pavements at Airports, Sea Ports and even Distribution Warehouses (inside and out) have been successfully extended by selective Vacuum Void Grouting.

The Process

The process involves drilling an area extending 2m either side of the joint on a nominal 1m grid. Vacuum ducts are then placed parallel to the joint over alternate lines of holes, a polythene shroud sealed over the whole area, and a vacuum source is applied to create an airflow.

Introduction of resin grout to individually isolated holes between the vacuum ducts is carried out until refusal, or until resin in drawn to the holes beneath the vacuum ducts.
The equipment is then removed, and the holes topped off with grout.

Outcome

Vacuum Void Grouting provides an efficient and cost-effective method of reinstating slab support, thus stabilising voided or rocking slabs, and prolonging the life of the pavement. Coupled with modern testing techniques, which can be used to both identify joints warranting treatment and verify the effect of that treatment, the process provides a real opportunity to generate maximum value from limited maintenance funds.

Stabilisation of slabs by Vacuum Void Grouting

Application of the vacuum creates an airflow pattern, drawing air from the sub-base and down the feeder holes. Replacing the air inflow with grout results in the filling of the void.