



A40 Eastbound

Vacuum Void Grouting

www.balvac.co.uk
enquiries.balvac@balvac.co.uk
01928 719 875

Balvac
Balfour Beatty

Vacuum Void Grouting provides a long-term fix to a damaged section of the A40.

Addressing the root cause of the problem

With significant reflective cracking through the substantial (~200mm) blacktop overlay, and evidence of a small area of subsidence in lane 1, this section of a key arterial route into London was in clear need of some remedial action.

The Proposal

To simply plane off, and then replace, a proportion of the existing overlay would only have provided a temporary fix. It would not have addressed the root cause of the problem, and the reflective cracking would have quickly returned. Aside from this meaning an unacceptably early return of road works, with their associated costs and disruption, reflective cracks all too soon turn into potholes and potentially cause damage to vehicles.

Scope

Balvac's Vacuum Void Grouting is specifically designed to enable the controlled introduction of a resin grout to fill small voids beneath the joints of rigid pavements. The grout stabilises and supports the construction and was selected as the best means to address the root cause of the problem at this site. By using vacuum, as opposed to pressure, this technique eliminates unwanted lifting forces and controls the grout flow. Consequently, grout is held in the targeted voids and not pumped into underground services or subgrade drainage.

The process involved drilling some 643 holes on a nominal 1m grid in the areas selected for grouting. Vacuum ducts were then placed parallel to the transverse reflective cracks over alternate lines of holes. A polythene shroud was sealed over the whole area, and a vacuum source applied to create an airflow (see diagram below).

This airflow from the surface was replaced by the introduction of resin grout to individually isolated holes between the vacuum ducts, which continued until refusal, or until resin was drawn to the holes beneath the vacuum ducts. The resin grout on average takes 3ltr/m² at 3ltr/m² (plus an inclusion of 550Kg of inert filler). This higher than normal usage clearly demonstrated the presence of voids and vindicated the client's decision to stabilise the pavement prior to overlay works. Once the Vacuum Void Grouting had taken place, the principal contractor planed off and re-laid 40mm of asphalt and all works were completed within a 2½ week period.

Outcome

Vacuum Void Grouting provides an efficient and cost-effective method of reinstating slab support. Therefore stabilising voided or rocking slabs prolongs the life of the pavement and generates maximum value for the client from what are usually 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.

