the design. Viabase is a 'sandwich filler' that can be used between a base course and overlying wearing course to make up any difference in thickness between old and new surfaces," says Pownall.

"Viabase can be laid in varying thicknesses without producing uneven rutting which made it ideal for the job at Bidston Moss. Replacement of the upper regulating layer with Viabase meant that the new surface would be no thicker than the existing surface and would not increase the loading on the viaduct."

Trials of the revised pavement design were carried out in the works compound located directly below the viaduct. A concrete slab was laid within the compound to the same specification as the bridge deck. The slab was then coated with Eliminator primer and waterproofing, then covered by a tack coat intended to bond the waterproofing to the lower regulating layer. The lower regulating layer, Viabase and the UL-M wearing course were laid and rolled at the minimum and maximum temperatures to check the specification.

Alterations to the surface specification delayed the start of the works from August until mid September which added potential weather problems to the equation. Pownall says: "Bidston Moss is an extremely open and exposed area. So with the bridge deck of the viaduct roughly 25m above ground level we knew that high winds and rain were likely to be a problem."

Work began on removing the existing surface which showed the exposed concrete deck to be extremely uneven. Extensive epoxy mortar repairs were necessary to even out the surface before resurfacing could start. "The existing waterproofing varied in thickness even more dramatically than the surfacing - from 10mm to over 40mm thick in less than 50mm!" says Pownall.

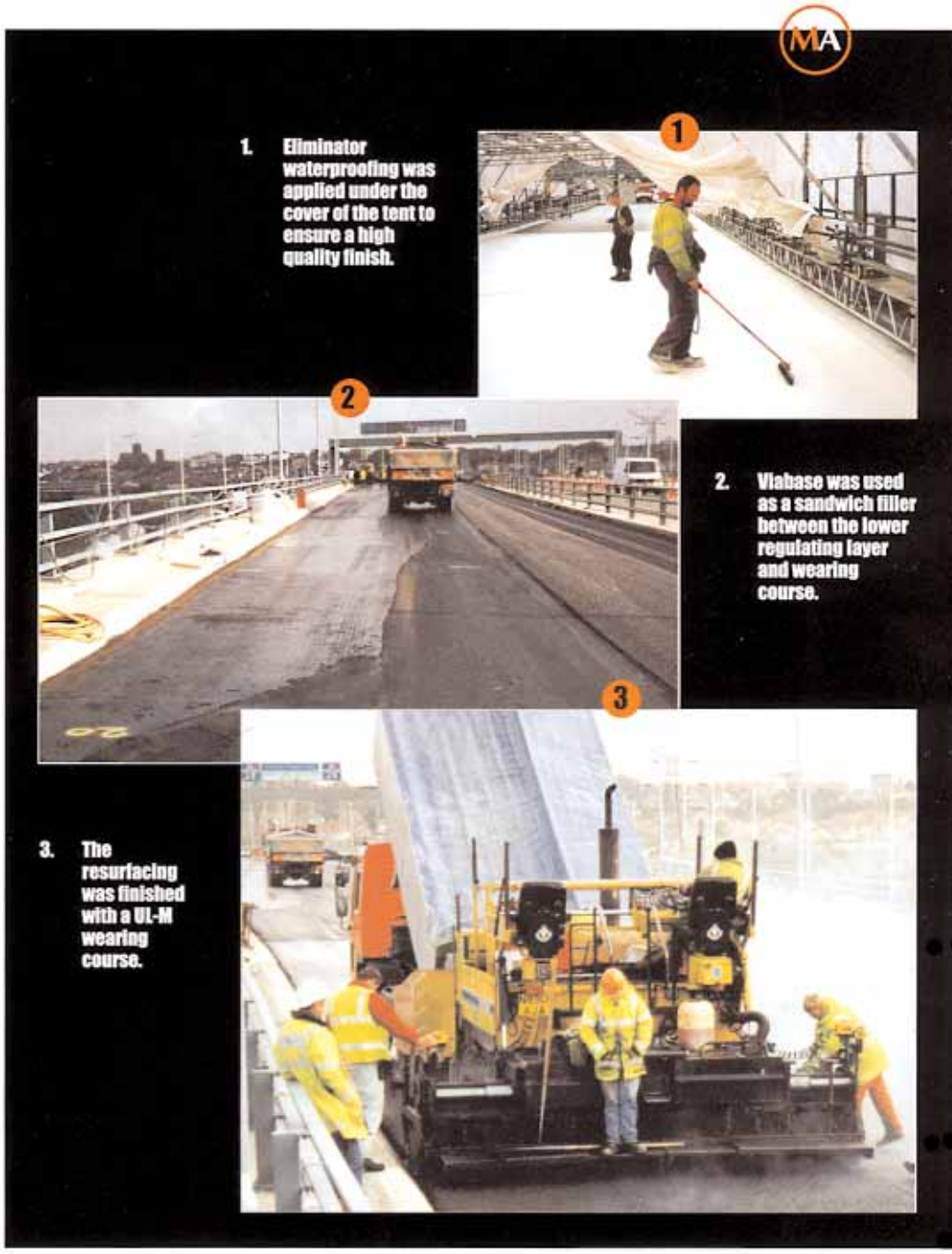
Spraying of the primer and waterproofing was also delayed by high winds and damp conditions but postponement of the work until the following summer was just not an option according to Pownall: "The existing surface was in an extremely poor condition and would not last another winter – it was a case of now or never."

In an attempt to beat the weather the team decided to cover the works in a tent so the effects of the high winds were reduced. On paper the exercise might sound easy but securing a tent structure to the deck in strong winds without it blowing away was an entirely different matter.

With the tent secured, work began on spraying the Eliminator waterproofing and installing a new positive drainage system. Pownall says: "Previously the drainage system had allowed water to pond in some areas and in combination with frost action probably created another factor working against the previous surfacings. The aim of the positive drainage was to remove water quickly and lower the potential for frost action damage to the new surface."

After all the delays encountered leading up to the surfacing, the laying itself went almost without a hitch apart from some minor interference by the weather. The project was finally completed in mid November – six weeks late and at a final cost of £1.3M but Pownall is still smiling.

"Despite finishing late and over budget the HA is well aware of the challenges which were thrown at us during this contract and have commended us on the way we coped. At the end of the day we got the job done and we're quietly confident that we won't be back in five years time to do the same job again!"



1. Eliminator waterproofing was applied under the cover of the tent to ensure a high quality finish.

2. Viabase was used as a sandwich filler between the lower regulating layer and wearing course.

3. The resurfacing was finished with a UL-M wearing course.