

Thin layer surfacing specs under review

The Highways Agency is expected to revise its bridge deck surfacing specifications to omit the sand asphalt layer altogether, delegates at the UK Society of Chemical Industry's bridge deck seminar heard in March. Richard Jordan of TRL, which is carrying out research into bridge deck surfacing on behalf of the Highways Agency, said that the need for the protective sand asphalt layer was now being questioned, and the specification was likely to change in due course.

This aspect of the surfacing system was originally specified in order to protect the waterproofing membrane from damage, but many of the modern membranes now available no longer need this protection, he said. By omitting the sand asphalt layer, thinner (and hence lighter) surfacing systems could be achieved.

But Jordan also stressed the importance of subsurface drainage, a message which was reinforced by speakers throughout the day. A lack of sufficient subsurface drainage had been responsible for some serious pavement failures, Jordan said, because there was often a tendency to regard the surface course as impermeable. Voids in the binder course allow water to penetrate down to the waterproofing membrane; in some cases where the volume of voids is particularly high, water may even 'flow' through the binder course to congregate at low points.

Failure of surfacing on bridge decks is particularly serious because it is very expensive to repair, and often requires the closure of at least part of the structure, making the political cost high as well as the financial cost.

Thin surface systems, which are becoming increasingly common as engineers try to reduce dead load on structures, tend to give greater problems than traditional depth systems. Bulk void content must be minimised, and voids at the interface between the waterproofing system and the overlay must be avoided, Jordan said.

Drainage was a very important consideration - both surface and subsurface drainage should be provided, he said, and crossfalls and gradients



Major structures such as the Runyang Bridge place tough demands on surfacing systems. Epoxy asphalt was specified for this project (Chemco Systems)

were necessary in order to drain the deck effectively.

The bond between the waterproofing system and the deck was important, as was that between the waterproofing system and the asphalt, Jordan stressed. Where the waterproofing system was suitable, the sand asphalt layer should be omitted, he explained, as this is very prone to rutting. However in some cases it is still needed, depending on the waterproofing system being applied.

One problem with trying to produce new guidelines, said Jordan, was that some of the requirements for producing a high quality result were conflicting. In order to activate the tack coat of a waterproofing system, compaction had to be carried out at a high enough temperature. But if the temperature was too high, the waterproofing system could be damaged; characteristics such as the crack-bridging properties of the waterproofing could be reduced.

Jordan also stressed that laying and compaction of surfacing layers had to be carefully coordinated, particularly for thin surfacing where the layers would cool rapidly. Another issue to consider was penetration of the waterproofing system by coarse aggregate. "The waterproofing system must not be

damaged by coarse aggregate indentation," warned Jordan. Some systems have passed aggregate indentation tests at 125°C, but he said it was very difficult to compact coarse aggregate onto a system that was susceptible to penetration. In such cases careful design and construction was required.

The HA is also considering a significant increase in the bond strength requirements for waterproofing systems, with different requirements for thin surfacing. Jordan stressed that they would not consider systems less than 60mm thick for concrete bridges.

Presenting the case for waterproofing manufacturers, Adrian Pike of Pitchmastic also highlighted the forthcoming changes, and other aspects such as accreditation of installers.

Over the last 12 months, said Pike, various aspects of bridge deck surfacing systems had been under review, with the aim being to enable earlier application to concrete and improve the bond between the membrane and the concrete. Techniques to improve the application of systems to non-standard concrete surfaces were being investigated, and attempts to develop more sophisticated designs.

Future plans for the project included introducing new accreditation standards for installers, which would enable contractors to prove that they were experienced in the application of such systems, but that they could achieve the standard in terms of quality, safety and so on. Extending such quality accreditation to companies based in countries that recently joined the European Union would ensure European harmonization.

Delegates to the seminar also heard presentations from representatives of the asphalt industry, explaining the benefits of their various systems, including mastic asphalt, epoxy asphalt, machine-laid gussasphalt and epoxy plug joints. Richard Hughes of RSAG presented information about 'hybrid' joints that were currently being developed to improve the mechanical capacity of asphaltic joints. Products involve a combination of asphaltic and mechanical systems, incorporating a coil that is fixed to the deck and infilled with asphalt, with movement of up to 100mm. This is currently being pioneered by company RSAG.

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