

Hitex comes of age

Development work by aggregates specialist Bardon aimed at improving the characteristics of stone mastic asphalt has resulted in Hitex - Britain's first totally home produced high durability thin overlay.

Hitex surfacing received the blessing of the Highways Agency late this summer, a formal approval which acknowledged the product's qualities and the years of endeavour behind its development.

Hitex's history is relatively short but much has been packed in and already the material has proved its worth as a thin overlay for high speed, high risk sites.

"We've ended up with an extremely hard wearing surfacing that resists both rutting and skidding, that is quick to lay and reduces

noise and spray in use," says the product development director of Bardon, Paul Phillips.

"Obtaining Highways Agency approval means that Hitex is the latest of only three approved thin surfacing systems in Britain - and the only one actually developed here."

Phillips claims that the development of Hitex was not a direct response to the emergence of the original two systems during the mid-1990s, nor initially to what has become a fast growing market for thin overlays.

In fact, Hitex evolved from work carried out by Bardon to maximise the benefits of stone mastic asphalt (SMA).

SMA is the favoured road building material of some countries on the Continent, a bituminous mix which depends on a higher stone content than the mortar rich hot rolled asphalt generally used in Britain. SMA's stone skeleton results in a dense matrix of high durability and Bardon was one of the first companies to explore the material's advantages in this country.

"We were one of the pioneers

here in SMA, looking at the material first in 1991. We learned a lot about its critical aspects, such as aggregate size and shape, the contribution of the skeleton, the contribution of the fibres added to the mix, air void importance and so on," Phillips says.

"We also identified where it might be improved. SMA is fine, in our opinion, for urban situations but not necessarily the optimum solution for high speed applications. Long term retention of texture, for example, and the maintenance of skid resistance were areas where we thought improvements could be made."

So Bardon began looking into ways of upgrading SMA for British applications. The company knew that in its Millom quarry it had some of the best stone available in the UK, in terms of high polished stone value (PSV) and low aggregate abrasion value (AAV).

With Millom stone, Bardon felt it could maintain the surface texture (and hence skid resistance) of an SMA mix while reducing both noise and spray.

The company's technical department looked into stone grading and the mix skeleton, using Millom. At the same time, Bardon asked bitumen specialist Nynas to design and produce a highly adhesive binder.



High risk sites - which need durability and resistance to skidding - are a speciality for Hitex.



Hitex provides an ideal

This was back in 1993, before "thin surfacings" were widely recognised in Britain as distinct, viable techniques.

The material that Bardon came up with - Hitex - was trialled at a quarry entrance in County Durham, on a stretch of road with a 1:5 gradient and three sharp turns. The Hitex was laid to a variety of thicknesses, from 22mm to 40mm; and performed extraordinarily well, according to Bardon's contracts director Paul Fleetham.

"The results were impressive with the material easy to lay. The binder proved tenacious with no need for anything but an ordinary tack coat to adhere to the underlying surface. The texture and skid resistance achieved from the material were superb, as was the resistance to severe braking stresses and rutting.

"We calculated that the surfacing carried trucks hauling about 500,000t of stone in the first year of the trial without any signs of deterioration or loss of surface characteristics."

Bardon was sure it was on to a winner, with a thin overlay possessing remarkable properties of durability and skid resistance. In the company's view, Hitex was certainly a product which could compete with the two thin surfacings that were then establishing themselves in the

During the two years of Doncaster trial, Bardon sold Hitex into a number of difficult jobs where the clients accepted the material for its problem solving capabilities. Three of these contracts are described below.

1. Bushey Arches, Hertfordshire. Here, a roundabout and its immediate approach roads (which were inclined) were proving impossible to maintain. Skid resistance was being lost almost immediately from freshly laid HRA and fast moving, heavy traffic was rapidly wheel tracking the surfacing.

SMA would not have wheel tracked, but nor would it have provided early resistance to skidding. The client, Herts CC, accepted the argument that Hitex was the ideal material for the high stress site.

The work was carried out in March 1996 under a partnering agreement between Bardon and specialist contractor Ringway. Around 1000t of Hitex was laid, at night in temperatures down to 0degC. The roundabout surfacing has been closely monitored and the project has been "an outstanding success" according to the material supplier.

2. Trinity Road, Wandsworth. The problem with this stretch of highway was cracking of HRA resulting from movement of concrete slabs forming the road base. Client London Borough of Wandsworth wanted a material with improved resistance to crack propagation plus long term durability. It got Hitex which has met its criteria admirably. The road is heavily trafficked, especially during Wimbledon fortnight which was the time last year when the surfacing was carried out. Disruption was kept to a minimum - Hitex is laid by conventional plant and because with SMA based products no chipping spreader is used, requires possession of only one lane at a time.

Close to 1500t of Hitex were laid, along two lanes and various slip roads, by contractor Ringway.

3. Series of roundabouts at Peterborough. This stretch of road is heavily trafficked and client Peterborough City Council specified minimum interruption of vehicle flows during surfacing.

HRA would have required a chipping spreader, occupying two lanes. Also, tight turning around the roundabouts would have meant irregular placement of chippings, and chipping loss.

Hitex was deemed to be a superior product for the site in terms of durability and skid resistance; also, as alluded to above, as there are no precoated chippings with Hitex, there are no chippings to misplace, a spreader is not required and traffic flows could be maintained.

Some 800t of Hitex was laid, by Bardon Surfacing.



urfacing for fast moving urban traffic.

marketplace, Safepave and UL-M.

First, though, a level playing field had to be created. Safepave and UL-M had both acquired Highways Agency approval while Hitex was being developed. The need was pressing to obtain similar approval for Hitex as quickly as possible.

"We found that, with the work that we had already done, we were four fifths through the HA's five point approval scheme.

"We'd already done the desk study, the lab work, the pilot scheme site and so on.

"Now we had to carry out a full scale, 24 month trial and for this, laid Hitex on a stretch of A635 near Doncaster."

This was in August 1995. Cores were taken which indicated an almost total resistance to rutting - "in fact, the test house said they were the lowest numbers they'd ever seen" - and a close watch kept on the carriageways during the trial period.

All went remarkably well and the nod from the HA came exactly on schedule, two years on in September 1997.

"Our product is establishing a first class track record (see box above)," Phillips says. "With the way now open to trunk road contracts, we believe that Hitex will do extremely well in the marketplace, such are the product's advantages."

A first class track record