

ULTILAYER SAMI

Proven performance

Extending the life of asphalt overlays on concrete based roads

The challenge

The asphalt overlay on the busy A55 and A483 in North Wales had come to the end of its design life and needed to be replaced. Cracking had been a problem on this section of road due to the underlying jointed concrete construction and a long-lasting surfacing solution was required that could resist cracking and minimise future interventions.

Since this is an important strategic route with no easy diversions, it would also be important to complete the work quickly and minimise closures and disruption to road users. Early contractor involvement with the client started around two years before, when options were being considered and designs were being prepared for the first phase of the scheme.

Tarmac proposed using an alternative approach to extend the life of the asphalt overlay using ULTILAYER SAMI, an asphalt Stress Absorbing Membrane Interlayer laid onto the existing jointed concrete base and ULTILAYER, a polymer modified asphalt as the binder/ surface course.

Crack resisting asphalt interlayer

Extensive trials have shown that using a SAMI significantly reduces cracking in concrete overlays. As a finely graded asphalt containing a heavily polymer modified bitumen binder, it is laid directly on to the concrete base and provides a flexible buffer to accommodate movement and prevent cracks appearing in the asphalt layers above. It is installed with an asphalt paving machine making it easy to accommodate within resurfacing programmes,

compared to products like geogrid that require specialist installation teams. It is also simpler to recycle at the end of its life than a geogrid type material. ULTILAYER, Tarmac's polymer modified asphalt also has a proven record as a durable, crack resisting surface course.

Evidence based choice of materials

ULTILAYER SAMI has a strong base of supporting evidence having been tested extensively by the University of Nottingham's Transport Engineering Centre (NTEC) where it demonstrated exceptional fatigue resistance. It also has been successfully used on the UK road network since 2008.

Evidence from the original trial site on a section of jointed concrete based dual carriageway on the A45, near Billing in Northamptonshire showed that



after 11 years trial sections using Utilayer SAMI were still free of cracking. This compared to visible cracking and potholes on neighbouring sections using a conventional SMA regulating plus geogrid solution.

Contracting excellence

With an ambitious target of planing out and resurfacing four and half thousand tonnes of asphalt over two weekends, efficient working and close collaboration were essential.

The planing contractor National Road Planing used a wider 3.8m planer to increase productivity while planing out the old overlay. This was combined with echelon paving, using two paving machines working at the same time. As well as increasing speed of construction, this allowed for accurate paving and seamless hot jointing of the surface to provide the best possible finish to the surface and deliver long term durability.

Business process optimization (BPO) technology was used to coordinate material deliveries and ensure a steady supply of asphalt to the pavers to allow

continuous, non-stop paving. As well as optimising productivity and pavement finish this helped to minimise vehicle movements and associated carbon emissions. Both Tarmac Contracting and NRP, the road planing contractor, were able to draw on their experience of paving the new Silverstone race circuit, completed in 2019, which also required detailed planning of logistics and close collaboration to deliver an exceptional finish.

Work was carried out during closures at night and weekends, to minimise disruption to road users on this important transport route, with lane closures during the day.

Working closely in partnership with local authorities to use their road network and manage traffic flows over the duration over the project was also an important part of the planning process.

Results and benefits

Combining an innovative choice of material, with the latest contracting methods helped to optimise the quality of the new asphalt overlay and deliver a proven, evidence-based solution

to the problem of cracking on this strategically important section of road.

Efficient delivery of the material to site allowed continuous paving, which improved the speed of construction, the quality of joints and the finish achieved.

The client commented on the improved ride quality achieved which is increasingly being recognised as a factor in both pavement life but also vehicle fuel consumption. However, when combined with the used of the SAMI and Polymer Modified surface course, this will also help the new asphalt overlay to last longer.

The client was delighted with the outcome:

“Tarmac are on our current framework and have been performing well. The relationships have been excellent. The overall surface design has eliminated the transverse joints we had previously, which has improved the ride quality quite significantly. The tolerances used on the surfacing plant is quite noticeable in the overall ride.” David Cool, Head of Service North & Mid-Wales Trunk Road Agency.