

**Tarmac**

# Premium approach brings long lasting solution

Westminster City Council has solved a chronic problem – with a bespoke high performance asphalt pavement developed in partnership with its term maintenance supplier and Tarmac.

**T**raffic conditions in Westminster have been producing acute but not necessarily unique examples of repetitive pavement failure under heavy, slow moving vehicles. Many highway authorities may be seeing similar reappearance of deep ruts in their roads and should consider adopting the approach which has solved the problem in Westminster.

It is now over a year since a partnership of Tarmac, Westminster City Council and its highway term maintenance partner Westminster Transerv (a Balfour Beatty/Mouchel joint venture) developed and constructed the solution. Previously, deep ruts had reoccurred three months after resurfacing but these have not reappeared this year – vindicating Westminster’s decision to develop a bespoke, high performance asphalt pavement.

This option was suggested by Tarmac in meetings with the council to discuss what to

do about problematic parts of roads in Regent Street, Oxford Street and Oxford Circus. It would involve development of high specification materials specifically for the sites, with substantial testing and optimisation of the asphalt mix constituents. Westminster, for its investment, would get a long lasting end to the problems.

**“Working in partnership with Westminster Transerv and Tarmac, we have achieved a high quality road pavement which will provide value for money in the long term.”**

Rakesh Vaghela

“All three parties were engaged in the development process from the start and we were able to draw from our experience of

technically challenging projects to advise what would work best in the long term,” says Technical Manager Tim Smith of Tarmac National Contracting Southern Region.

The decision taken was to completely restructure the asphalt pavement with a bespoke design, but only in the worst affected areas of Regent Street, Oxford Street and Oxford Circus. “The client was trying this out. The approach was new to them,” Smith says.

“We – all of the partners – were looking for performance, particularly resistance to deformation under the heavy point loads applied by stationary delivery vehicles and slow moving buses; and the solution needed to exhibit very good crack resistance to prevent reflective cracking coming through.”

Buses are frequently nose to tail in Oxford Street, especially where pedestrian refuges and narrow traffic lanes channel the heavy vehicles onto exactly the same path and wheel tracks. And throughout Westminster, traffic lights cause buses to move slowly and stop repeatedly in exactly the same place, creating ruts up to 100mm deep in places. “Slow moving heavy traffic, particularly buses, can be problematic for traditional asphalt materials,” says Smith.

Tarmac’s bespoke solution was designed and developed at its Ettingshall laboratory. A 10mm dense asphaltic concrete, based on the design principles of French EME (Enrobé à Module Élevé) asphalt, would be laid beneath a high performance asphalt surface course. Included in both was a polymer modified bitumen binder – Nypol SP – newly developed by Nynas Bitumen for withstanding very heavy loads.

Conventional asphalt pavement in Westminster had been unable to withstand heavy point loads from slow moving buses following similar paths





Tarmac National Contracting laid bespoke high performance asphalt in Regent Street (above), Oxford Street and Oxford Circus successively over 12 nights

Various mix formulations were tested at Ettingshall, “to optimise the aggregate grading and the binder content and to prove the compatibility of the various constituents”, Smith says. “We also carried out mix performance tests to ensure the pavement would be able to withstand heavy loads applied repeatedly over a long period of time.”

Tarmac has invested over £250,000 in test equipment to give it the in house design and testing capability for EME materials. “The testing was carried out over a number of months, in continuous liaison with the council

and Westminster Transerv to ensure we met the exact requirements,” says Smith. “We came up with a high performance pavement with variations in design across the locations and traffic lanes to accommodate different flows and weights of traffic.”

Asphalt layer thicknesses also varied, “because Westminster’s roads have evolved to the condition we found them in”, Smith says. Depths to concrete road base beneath the three roads ranged from less than 100mm to more than 200mm. Tarmac’s pavement design took this into account, with asphaltic

concrete binder courses 40mm to 150mm thick and a 40mm layer of the high performance surface course.

Around 1000t of these binder and surface course materials was laid by Tarmac National Contracting over 12 nights in August 2007 as part of a total project valued at just under £1M. Sites in Oxford Street, Regent Street and Oxford Circus were planed out and resurfaced in succession during road possessions between 10pm and 6am. “Testing of the newly laid materials started immediately and we have been regularly monitoring the sites for deformation ever since, with none detected,” Smith says.

So, great success achieved so far, given that ruts previously appeared after three months. Westminster selected a premium approach, but a good one, that should pay off in the long term. The council’s Assistant Service Manager for Highways Rakesh Vaghela says: “An innovative solution was required to ensure the selected pavement solution is durable. Traditional design and materials was not a viable option.

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Westminster City Council selected a premium approach and achieved a long lasting pavement