

A507 AMPHILL BYPASS ASPHALT REINFORCEMENT
AMPTHILL, BEDFORDSHIRE, UK

ASPHALT REINFORCEMENT

Product: Road Mesh

Problem

A section of the A507 trunk road bypasses Ampthill in Bedfordshire. Bedfordshire County Council (BCC) wanted to resurface the pavement in order to extend the pavement life and repair fatigue cracking which had developed within the existing pavement construction.

Solution

Babtie Ltd, working on behalf of BCC, decided to utilize pavement reinforcement within the highway construction, in order to further enhance the pavement design life.

Axle loads of 90kN/axle were used in the design. With assistance from Maccaferri Ltd, Babtie used the OLCrack pavement reinforcement design software, developed by the University of Nottingham to calculate the likely extension in design life through the introduction of Road Mesh™ within the bound layers of the pavement.

The existing road surface was planed to receive the reinforcing steel. Loose areas of scarification were repaired prior to the Road Mesh™ being placed, to ensure good bond between the existing and new pavement.

Road Mesh™ is made from hexagonal woven steel wire mesh. Every 160mm, a transverse steel bar is woven within the mesh, locking it into position. The steel is heavily galvanised (in accordance with BSEN 10244-2 Class A) to offer an expected design life in excess of 60 years. As it has a very open mesh, Road Mesh™ allows excellent contact between the existing pavement and the new overlay. This means that the bond between the two layers is not compromised by the presence of the Road Mesh™ reinforcement interlayer.

Once unrolled on the planed pavement surface, the Road Mesh™ was rolled with a pneumatic tyred roller in order to remove any remaining 'memory' within the mesh. There is no standard method to fixing Road Mesh™ to a substrate. This is dependent upon the experience of the installing contractor, the individual site circumstances and the condition of the surface on which the mesh is to be placed.

Some contractors use a 'blinding' or 'tensioning' method with no nails at all. On this project, Tarmac-Johnson used a cartridge tool and 50mm long nail fixings with an integral square washer.

An 80mm wearing course was then placed onto the Road Mesh™ with a standard Blaw-Knox paving machine. In places



Unrolling the Road Mesh™ onto the planed surface



PTR rolling the Road Mesh™ to conform it to planed surface



Asphalt being placed onto the Road Mesh™

Client:

BEDFORDSHIRE COUNTY COUNCIL

Main contractor:

TARMAC & TARMAC-JOHNSON

Designer:

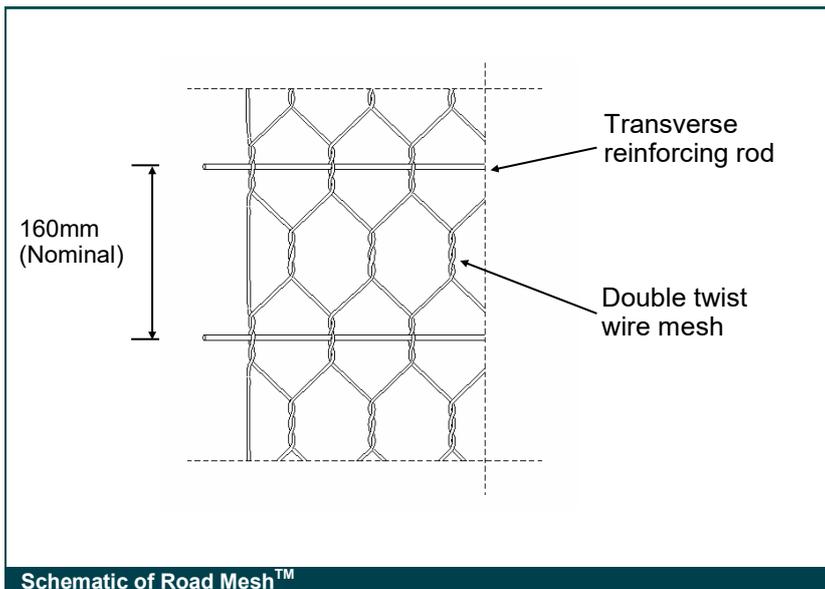
BABTIE LTD.

Products used:

ROAD MESH™

Date of construction

June 2001



Schematic of Road Mesh™



Rolling the wearing course

this was increased to 100mm in accordance with the design.

The Road Mesh™ was placed on one carriageway first and overlaid. 800mm (longitudinally) of Road Mesh™ was left exposed. Road Mesh™ was then laid on the opposite carriageway and was overlapped by 300mm onto the adjacent exposed mesh to ensure continuity of reinforcement bond across the crown of the road. The wearing course was then applied onto the remaining carriageway and rolled.

In research at leading universities in the UK and the USA, Road Mesh™ is shown to interlock very effectively with the bitumen bound aggregates within the pavement construction. This stiffens the pavement structure, binding it together and enabling it to perform better. This interlocking effect minimizes bond reduction and aggregate shearing within the asphalt matrix; the cause of rutting and shoving. Road Mesh™ absorbs loads applied to the pavement, which would otherwise be transferred into the asphalt. Four point bending tests showed Road Mesh™ can extend the service life of asphalt overlays by three times and that it can halve the magnitude of rutting in the asphalt. Also, full scale trials showed Road Mesh™ decreased the strain within the pavement structure by 72%, extending the fatigue life.

The result of the inclusion of Road Mesh™ is that the pavement lasts longer, reducing maintenance, the costs of disruption and environmental impact.



Placing wearing course onto Road Mesh™



Rolling the wearing course

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