

A4144 ABINGDON ROAD REFURBISHMENT

OXFORD, UK

PAVEMENTS

Product: ROAD MESH & ENKAGRID TRC

Problem

Abingdon Road is an old road linking Oxford City Centre to the Southern By-Pass. It is heavily trafficked by up to 20,000 vehicles per day and coupled with poor ground conditions, the road could no longer meet the demands of present and future traffic. A substantial section needed urgent repair, which had to be carried out without closure of this main arterial road.

Abingdon Road lies over drained flood plains, close to the River Thames. The natural ground beneath the road construction consists of alluvial silts and soft clays with extremely low CBR values. The northern section of the road has been built over a marshy flood plain. Sections of the road have been widened and improved over a considerable time span resulting in an existing carriageway of highly variable makeup.

The presence, at very shallow depth, of utility mains services and the Norman Causeway Scheduled Monument, together with fixed upper levels, limited the overall thickness available for pavement reconstruction.

Solution

A decision was taken to reconstruct a 2km stretch of the roadway to provide a 20 year design life. A design incorporating Maccaferri pavement reinforcing materials was selected.

Ease and speed of construction was a key element in the design selection process because it was not possible to close the road as minimum disruption to residents and road users was essential.

The Council's engineering consultant, Babtie Group, was responsible for the design and specification of the new road pavement, with term contractor Isis Accord carrying out the construction.

Babtie sought design advice from Maccaferri on how to achieve a pavement with a projected lifespan of at least 15 years, in spite of the onerous design constraints: weak foundation, minimal depth construction of 500mm below existing levels and existing shallow services.

Client name:

OXFORDSHIRE COUNTY COUNCIL HIGHWAYS

Main contractor name:

ISIS ACCORD

Consultant:

BABTIE GROUP

Product used:

ROAD MESH & ENKAGRID TRC

Construction info

Start date: July 2003

Completion date: November 2005



Before installation, showing fatigue cracking



During installation



During installation

MACCAFERRI

Maccaferri proposed a combination of products to offer the required design strength for the 'thin pavement' construction, necessary for this project. The proposal included Enkagrid TRC 30 multifunction geogrid, laid on the weak formation to provide reinforcement and separation at the base of the new construction. In addition, Maccaferri Road Mesh Type L, placed deep within the HDM bituminous layers (260mm below surface) would then reinforce the 'thin pavement' construction to meet the design requirements.

Enkagrid TRC is a high strength, low strain composite geogrid used to strengthen pavement structures over weak soils. The geogrid is sandwiched within a polyester/polyamide geotextile, which acts as a separation layer, whilst the Aramid fibre geogrid provides the required reinforcing strength.

Road Mesh is a double twisted woven wire mesh manufactured from galvanised steel which is reinforced transversely at regular intervals with steel bars. Its principal use is to extend the fatigue life of bituminous overlays by inhibiting reflective cracking, rutting and 'shoving' failures.

In the Summer of 2003 a trial phase of 350m, from Step Ground Bridge to Vicarage Road, completed successfully.

Further phases were carried out, mainly during school holiday periods, leading to completion of the full 2km length in November 2005. All phases were completed on time and on budget, achieving a high quality construction with only modest disruption to road users and frontages.



Enkagrid TRC during installation



RoadMesh during installation



After installation

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