CEMEX

New Viafoam use slashes carbon emissions

Study of the first use of cold mix recycling with 'crack and seat' technology by CEMEX is reporting positive results of performance, cost and environmental impact.

Highway authorities should look out for a forthcoming report by research consultant TRL for proof of the merits of cold mix recycling for renewing composite carriageway. TRL has designed and studied the first use of Viafoam recycled asphalt combined with crack and seat technology for reconstructing a trunk road, with very positive results.

Viafoam – a cold mix product developed by CEMEX using foamed bitumen to coat recycled aggregate – was specified alongside crack and seat for the first time last year. TRL was asked to carry out a full analytical design of the combined process and provide reports on the project one year and two years following its completion. Report number one is due out shortly, but CEMEX has seen the initial draft and is already claiming the project an overwhelming success.

Viafoam has been used with crack and seat for the first time, backed up by rigorous design and testing and study of the material's performance

The location of the refurbishment was a 2km stretch of the A46 near Stratford-upon-Avon. The composite carriageway of lean mix concrete with an asphalt overlay had reached the end of its 20 year design life and was showing signs of heavy cracking.

Crack and seat involves breaking cement-bound or concrete carriageway into large fragments – typically 1m across – and then rolling it to form a compacted sub base. At Stratford-upon-Avon, the concrete was treated this way and the asphalt overlay was recycled into Viafoam and relaid as an alternative to conventional asphalt containing virgin aggregate.

According to CEMEX UK Construction Services – the contractor on the A46 job – the rigorous design procedure adopted for the contract and the subsequent reports will help to address concerns held in some quarters over the performance of cold mix recycling.

In general, insufficient testing of foam mix processes has led to sceptical views within the highways industry towards the suitability of the technique for heavily trafficked 'high stress' sites. The Viafoam product on the other hand, is supported by an integrated programme of in house material testing, manufacture and laying and uses specialised compaction equipment.

Recycled material for the A46 contract was designed in a laboratory using 10t of asphalt planings excavated from site. Trial mixes were developed – anticipated on the number of axle movements recorded on the carriageway – and verified for strength using testing equipment such as a falling weight deflectometer.

With the mix design completed, existing asphalt layers on the A46 were planed off and the planings fed into a mobile plant that crushed and screened the aggregate to provide particles no larger than 25mm in diameter. The strength of the Viafoam material comes from the interlocking aggregate, the screening of which was carefully monitored for quality control. Planings deemed not suitable for use were used to construct hard standings within the site compound where the material was crushed and screened.

> "Viafoam is supported by an integrated programme of material testing, manufacture and laying and uses specialised compaction equipment." CEMEX

The recycled material was stockpiled at the same compound where CEMEX also positioned its mobile Viafoam mixing plant, while work started on preparation of the carriageway sub base using the crack and seat process. Mixing and laying of the

Planings from the A46 were recycled using Viafoam and relaid as a base course over the crack and seat treated concrete sub base

Viafoam recycled material followed up immediately behind.

The planings were mixed with pulverised fuel ash (5% by volume) and cement (1.5%) to improve stiffness of the material and then coated with foamed bitumen. The cold mix recycled material was then laid to a depth of 150mm on top of the compacted sub base, followed by a 60mm hot mix binder course and a 30mm surface course.

According to TRL, specifying Viafoam for the base course made use of 40,000t of material that would otherwise have been taken away from site. This in turn saved 3500 lorry movements and choosing not to specify conventional material to reconstruct the base also saved the project around 30,000t in virgin aggregate.

Reduction of carbon dioxide emissions has also been calculated by TRL. Reduced specification of primary material and the associated saving of haulage miles led to a 92% cut in the volume of CO_2 generated by the contract. The scheme generated 72t of CO_2, compared with the likely 944t of CO_2 created by traditional reconstruction methods.

Financial gain for the client through the combined recycling and crack and seat operation was in the order of £400,000 – a 22% saving for a contract priced at £1.8M.

Viafoam had previously been specified on local roads in Lincolnshire, Devon and Cornwall and for the reconstruction of airfields for Defence Estates. The material's successful performance on the A46 will point the way for its greater specification on trunk roads when used in association with the crack and seat method of carriageway renewal.

The completed A46 site one year on – TRL has found the project an overwhelming success

AWARD NOMINATION FOR A46 TEAM

The A46 contract was carried out on behalf of a partnership known as the Construction Management Framework (CMF), which has been shortisted for a Contract Journal Award for its work near Stratford-upon-Avon. The CMF includes the Highways Agency (HA), its managing agents and 20 specialist contractors – including surfacing contractor CEMEX UK Construction Services. The framework suppliers are responsible for delivering road maintenance projects on trunk routes in the HA's Areas 9 and 10, which include large parts of the West Midlands and the North West of England.

The CMF is one of four contenders shortlisted to receive Contract Journal's 2007 'Construction Industry Environmental Leadership Award' for its delivery of innovation on the A46 project. The winner will be announced on Thursday 4 October at the Grosvenor House Hotel in London's Park Lane.

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