

Contaminants recycled with care

Tar bound asphalt arisings can be safely recycled back into carriageways using Eurovia Roadstone's Foambase road renewal technique.

Rejuvenating worn carriageway can sometimes lead to the discovery of hazardous materials, such as tar, hidden within the lower layers of an asphalt road. Finding contaminants can be a cause for concern, but dealing with the problem need not be too costly for councils or disruptive for motorists. Eurovia Roadstone, the UK asphalt production division of Eurovia, uses a process called Foambase which can be used to encapsulate, or seal, tar bound arisings, allowing them to be recycled safely back into the carriageway.

Coal Tar was widely used in road construction until the mid 1980s. Although similar in appearance to bitumen, its chemical compositions are significantly different. Consequently, tar is classified as carcinogenic due to its concentrations of Polycyclic Aromatic Hydrocarbons (PAHs) being in excess of 15,000 times of those found in bitumen. The Mineral Products Association advise that reclaimed asphalt with a total PAH level greater than 25ppm is not suitable for hot mix recycling. However ex-situ cold recycled bound materials present a low temperature alternative.

The basic principle of Foambase is to expand bitumen by contact with small amounts of water under carefully controlled conditions, then mix the foamed bitumen with cold moist aggregates. When the bitumen foam bubbles collapse they tend to grip the fine particles tightly, forming minute droplets of binder. These spread during compaction and moisture disperses to hold the coarser particles together. Low bitumen contents are effective in Foambase because the foam preferentially coats the fine particles, which then form the strong mortar that encapsulates the coarse particles.

Foamed bitumen provides a uniquely strong



Tar bound asphalt arisings can be recycled back into the road safely with the Foambase process

adhesive binder system that enables the use of a wide range of new and recycled aggregates.

Foambase was initially conceived as a conventional in situ highway recycling process that uses cold mix techniques and is laid cold to reduce carbon emissions. It has been used widely on schemes throughout the UK.

“We have made good use of Foambase on road recycling contracts in recent years and decided to develop the concept.” Jonathan Core

But the process also lends itself very well to reprocessing tar bound asphalt arisings because of the fact that material is mixed cold. Heating tar has been frowned upon for many years because of the toxic fumes that result. Reusing contaminated material in a road renewal also avoids the high costs associated with disposing hazardous waste at a licensed tip.

“We have made good use of Foambase on

road recycling contracts in recent years and decided to develop the concept for encapsulating tar bound arisings after hearing from some of our clients about the problems they have dealing with contaminated materials,” says Divisional Manager Jonathan Core. “Rehabilitating roads in this way has financial benefits for clients because they are not having to pay for the disposal of material off site and the performance of the finished product is comparable to hot mixed asphalt.”

One example of a Foambase scheme is Newtown Road in Worcestershire, a principal road from Worcester city centre to the Worcestershire Royal Hospital. Part of the Newtown Road outer bus lane scheme was suffering from rutting and reflective cracking. This spring, around 900t of Foambase was laid along the route.

A conventional solution would have seen removal of asphalt planings and their disposal to landfill before replacing it with three layers of conventional asphalt. But Eurovia Roadstone and Jean Lefebvre (UK) Technical Consultancy worked together to supply Foambase as a suitable alternative. Eurovia Surfacing laid the material on behalf of



Material is processed using mobile plant in a client's storage depot

Ringway, which carries out highway maintenance for Worcestershire Highways, a partnership with the county council. Mobile plant arrived on site, including a Wirtgen asphalt processing machine that features separate hoppers to receive the contaminated road planings and PFA. Mixed material was then sprinkled with cement and coated with foamed bitumen before being transferred to a paver for laying.

Reprocessing of the asphalt planings took place in a redundant hospital car park adjacent to the works site. This arrangement allowed

for the material to be processed without it technically leaving site. Of the 900t of recycled asphalt that went back into the road, over 80% was asphalt containing tar, 15% of the total volume was PFA, 3.2% was Nynas Nyfoam binder and 1% was cement.

According to Eurovia, making use of Foambase saved the client costs in excess of £100,000 that would otherwise have been associated with transporting tar bound material off site and disposing of it at a hazardous waste centre.

Eurovia's Foambase Supervisor Colin

Adams said that the paving crews on site wore specialist protective clothing when tar was found, but had no concerns about working with the material once it was processed. "The encapsulated material becomes solid very quickly once it has been laid. After two hours, we were able to apply a surface course on to the Foambase, which saved time on site."

Eurovia Roadstone's Operations Manager Ian Burrows added: "Foambase is a proven, successful technique and we look forward to its greater use. More people are becoming aware of the problem of tar in old roads and this is an ideal way to deal with the situation."

A spokesman for Worcestershire County Council said: "We have been very pleased with the results of the Foambase operation. Not only did it save transporting waste material off site, we also did not have to import new quarried stone on to the site.

"We have been monitoring the site and have, so far, found no cause for concern regarding the material's performance. This particular site is on a hill with a fairly large proportion of heavy goods vehicles and bus traffic, so therefore it is subjected to stresses greater than we would normally expect."



Rolling the recycled asphalt is a key part of the Foambase process

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