

Ringway

Performance assured by design precision

Quantities of mix constituents going into Ringway's Foambase process are being determined exactly, to meet growing demand for high performance recycled asphalt.

Environmental targets, landfill charges and aggregate tax – all are increasing interest in asphalt recycling as a financially prudent solution for road resurfacing projects. According to Ringway Infrastructure Services, such incentive is driving up demand for its Foambase recycling process, with the manner in which the technique is applied ensuring its success.

Each Foambase asphalt mix is designed specifically for the individual application after samples of the existing pavement have been tested to ascertain its nature. The exact mix constituents can then be determined for getting precisely the desired outcome, as demonstrated on the A338 near Bodenham in Wiltshire.

Ringway laid 7000t of Foambase along a 1.1km section of the A338 in May this year during a road reconstruction project for

Wiltshire County Council. The authority had not used Foambase before but was aware of its performance in the past and the possible financial benefits.

"We had previously looked at a number of different forms of construction and felt that this scheme was big enough to make recycling with Foambase worthwhile doing," says Wiltshire's Highway Network Maintenance Manager Peter Binley.

"The technique is providing a new way for us to make the budget go further by saving money on new materials and potential landfill costs," – as well as helping the council and other authorities meet their environmental targets on recycling.

Since completing the Bodenham job, Ringway has been appointed by Wiltshire County Council to reconstruct a section of the B4696 in the north of the county using Foambase. Plus a major Foambase contract

has been secured for a maintenance scheme on the A40 in Gloucestershire for the Highways Agency.

"The beauty of our system is that we know exactly what we're putting back into the road, so we have complete control over the design of the mix, unlike an in situ system" says Ringway's Technical Manager Jan Hemsley.

Ringway uses Foambase to produce base and binder course asphalt containing recycled material, cement and pulverised fuel ash

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(PFA) for footways and road construction. The process involves combining hot bitumen with cold water, causing it to foam and expand up to 15-20 times its original volume. A blend of aggregate, PFA and cement is then added to the bitumen foam, which adheres to the finer particles. The resulting material is laid conventionally, with rolling a vital part of the process, as compaction causes the bitumen bubbles to burst and bind the mix together

The aggregate is made up almost entirely of recycled material, either in the form of road planings or recycled glass, sand, waste from asphalt production and quarry dust. This feedstock is crushed and screened to create an aggregate varying in size from 20mm down; then mixed with a pre determined quantity of PFA and cement to obtain the

Rolling the recycled asphalt is a key part of the Foambase process, as compaction bursts the foamed material and binds the mix together





Some 7000t of Foambase was laid during reconstruction of the A338 this year – part of the 75,000t total quantity Ringway expects to produce this year

required strength before it is mixed with the foamed bitumen.

Foambase is a hybrid mix – as stated in TRL report 611 – explains Ringway’s Foambase Manager Mo Tolba. “The cement gives it strength, while the bitumen gives the required flexibility.”

A typical mix uses about 2% cement, 3% bitumen binder and 10% PFA – although this varies depending on the grading of the recycled material.

At Bodenham, Ringway planed out a depth of 300mm of the existing 40-year-old

carriageway to produce the majority of the material to be recycled.

“We were also asked if we could turn the existing substructure into Type 1 sub base to avoid the client having to bring in Type 1,” says Jan Hemsley. “We carried out mix trials with the original material, but there was too much sand in the mix and therefore we could not achieve the required strength.”

However, the remainder of the planed material has gone back into the Foambase mix, including lean mix concrete base course material and the original kerbs.

The Foambase at Bodenham was laid in three 80mm layers, before being overlaid with conventional binder and surface courses. Ringway set up the Foambase plant close to the road and used only four lorries to transport the planings to the plant and the new base material back out – a huge reduction in lorry movements compared to the number required if new materials had been used.

“On average, the Foambase operation uses 1 litre of fuel per tonne of material produced, in comparison to 9 litres per tonne through a conventional asphalt plant. Hence we get a substantial saving on CO₂ emissions,” says Mo Tolba.

Ringway expects to produce around 75,000t of the material this year, much of this for the company’s own term maintenance contracts in Kent, Worcestershire, Surrey and Lincolnshire. The market is likely to continue growing if prices of raw materials used in conventional asphalt keep going up.

“Materials that may have previously been sent to landfill or used for a lower grade application have now become a main ingredient for new bituminous bound pavement layers,” Jan Hemsley adds, “reducing extraction of virgin materials.”



Ringway established its recycling plant beside the A338 site, saving a huge number of lorry movements