

## Hanson

Potentially hazardous displacement of large stones from the filter drains on major highways need no longer be a problem thanks to a new product from Hanson.

# Keeping it under a cap

**M**ost filter drains alongside and in the central reservation of motorways and trunk roads in Britain contain large diameter aggregate to ensure rapid dispersal of surface water. The system is not perfect, not least because large vehicles veering off the highway can throw stones from drains onto the road.

Aggregate on a carriageway is an obvious hazard: stones up to 40mm diameter can cause real damage when flicked up by a tyre. Various methods have been tried to remove the risk but none seems satisfactory in all respects.

Now Hanson has developed an asphalt product together with BP Bitumen to form a porous 'cap' for filter drains that contains stones safely. It can also sustain heavy loads, be cleaned to maintain porosity, last 10 years plus and – at the end of its life – be easily recycled.

"We've named it Drainfalt and it really fits the bill," says Hanson's Head of Product Technology Chris Curtis. "Drainfalt is a very open texture mix of

*"Drainfalt is a very open texture mix of 28mm and 40mm aggregate, very few fines and a hitech polymer modified binder. It is comparatively strong and hugely porous."* Chris Curtis

28mm and 40mm aggregate, very few fines and a hitech polymer modified binder. It is comparatively strong and hugely porous: Drainfalt will take the weight of a truck but water pours through it."

Two major uses have been made of Drainfalt to date, alongside the A4232 leading into Cardiff and in the central reservation of the M4 near Port Talbot. The origins of the material are very much South Welsh – Curtis gives credit for the idea to Graham Jackson and Mike Samuel, contracts and technical managers respectively of Hanson's South Wales area.

"There have been problems here with filter drains and what we came up with to get over these was a capping layer not unlike conventional porous asphalt, but using 40mm diameter aggregate instead of 14mm," says Samuel. "There are lots of voids, even after compaction."

First use of Drainfalt, on the A4232, involved removing a 150mm depth of existing stone drain with a JCB, lightly compacting the remaining stone with a small roller to alleviate disturbance and then backfilling with the new material.

This was then rolled to lock its stone together and achieve a level flush with the surface of the road. Some 1500 linear metres of filter drain was capped with Drainfalt, the filter drain trench varying from 800mm to 1.2m in width. Conventional laying plant was used, the receiving hopper for the asphalt equipped with a sidewinder for easy discharge straight into the drain trench.

"Drainfalt is very quick to lay," Samuel says. "It is perfectly possible with one machine to lay 500t/day, equivalent to 3.5km of 1m wide trench, 150mm deep."

Cores were taken from the job and sent off for analysis. Hydraulic conductivity testing took place in situ. The results of this showed that water passed



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1. Conventional laying plant is used to lay Drainfalt, the receiving hopper for the asphalt is equipped with a sidewinder for easy discharge straight into the drain trench.

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through the Drainfalt in volumes fifteen times the minimum specified for conventional porous asphalt road surfacing.

Even after heavy rain, the client for the Cardiff work was highly impressed with the Drainfalt's ability to cope, according to Curtis.

Curtis says that Drainfalt is a derivative of Hanson's Tuffgrip thin surfacing technology, employing a similar kind of high performing binder. "The usual difficulty with an open texture mix is oxidation and hardening of the binder which eventually causes the asphalt to fail," he says.

Hanson drew on BP's 30 years of experience of binding porous type materials and an elastomeric bitumen binder of the Olexobit 100 series was picked as ideal for the job.

This not only produces a strong mix but resists oxidation in the long term; and in the short, provides a workable and not overly viscous material which aids laying, according to BP Sales Manager Mark Bunch.

"We were conscious that Drainfalt would be placed using a sidewinder and that the laying process involved relatively small quantities of material being discharged over a period of time. The materials and mix design have been tailored to suit."

Curtis points out that once Drainfalt has been laid, it can be put to immediate use, and that it will not subsequently be moved or deformed. Vehicles can run over it without damaging the material or causing problems for other vehicles by spreading loose stone.

He is also keen to emphasise Drainfalt's sustainability credentials, which are substantial. Firstly, the mix can use stone already existing in the filter drain as its aggregate. Once laid, a suction brush can be employed to keep the voids clear of debris. "Drainfalt's life expectancy is a decade plus," he says.

"After that, you can dig it up, take it back to the plant, screen it, coat it again and reuse the stuff."

The Welsh Office is sufficiently impressed by Drainfalt to allow it to be used on the M4. Use of Drainfalt is not currently hampered by lack of accreditation – no Highways Agency approval is needed for materials used off the hard shoulder and not meant to be trafficked.

Cost will not hold back the material's progress, Curtis says. "Considering the advantages it bestows, Drainfalt is competitive."

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