

Area 3 Filter Drain Refurbishment In-situ filter media recycling and stabilisation



In-situ recycling of the M4 central reservation filter media

Benefits

- Driving a More for Less initiative resulting in a combined cost saving of circa 55%
- 50% cost savings on Traffic Management
- Multiple StoneMaster units optimise use of TM and reduces roadworker exposure by 50%
- Patented StableDrain increases network safety
- Innovative approach reduces network occupancy by 50% and improves Journey Time Reliability
- Carbon emissions reduced by 52 tonnes.

Carnell have utilised innovative working techniques to undertake high-speed filter drain refurbishment, in-situ for EnterpriseMouchel (EM) in HA Area 3.

Over time, the efficiency of filter drains are reduced, as silt and fines from surface run-off blocks the voids between the aggregate. This can be to such an extent that an impermeable barrier can be created and as a result, water is not removed from the highway area. The consequences of not refurbishing filter drains are flooding of the running lanes and surrounding area and a deterioration of carriageway sub-base layers, ultimately reducing its life-span.

By running two of their versatile StoneMaster units in tandem, it took just

9 nights (instead of the 18 originally programmed) to recycle more than 4.5 km of filter drain, returning them to their optimum performance. At the same time, the filter media was also reinforced using the patented StableDrain system, to make it more resilient to vehicle encroachment.

Before the site operation got underway, survey teams from Carnell assisted EM in identifying areas most in need of maintenance: A Drive-Through survey determined the locations of filter drain, its surface condition and the carriageway profile. The subsequent Trial Excavations assessed the filter drain dimensions, the depth of silting and the filter media grading, to establish its suitability for recycling.



The M4's newly optimised drainage system



Prior to refurbishment the M4 filter drain was ineffective

To ensure compliance with waste management and environmental legislation, samples of the filter material were taken for independent chemical analysis. Levels of TPH, PAH and TOC were measured, whilst WAC tests were also carried out.

EM instructed Carnell to use their proven recycling and stabilisation technology in 9 locations on the M4, A34 and A31 in both the verge and central reservation. To reduce the time spent on the network, Carnell mobilised two of their StoneMaster fleet (SM3 and SM6) in the same TM closure, minimising disruption to the road user and enhancing workforce safety.

The sustainable StoneMaster process has advantages over both the traditional 'dig-out & replace' and 'off-site recycling'

methods, in that only arisings containing silt, fines and aggregate not conforming to type B specification, are taken from site to tip. This reduces vehicle movements, usage of raw materials and landfill tax.

Between them, the two crews covered a distance of 4,650 linear metres which resulted in over 5,100 tonnes of aggregate being recycled and immediately reinstated to the drain. Carnell estimate this removed more than 500 HGVs from the network and gave a Carbon saving of approximately 52 tonnes.

An additional benefit Carnell provided, was the application of StableDrain to the newly refurbished filter drain. This TRL approved solution involved the installation of a geo-grid in the upper layers of the drain, providing a surface able to withstand loading from vehicles which

stray onto the filter drain at speed. Subsequent risks resulting from stone scatter and recovery operations are therefore significantly reduced.

Carnell completed the required length of refurbishment in the 9 nights agreed by EnterpriseMouchel, meaning that the scheme was delivered to programme and target cost. EM General Manager James Haluch remarked: **"Carnell are an integral part of the Area 3 supply chain and have demonstrated both a considerable reduction in the costs of maintenance, and significant improvements in roadworker safety."**

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