



Bagged Material Trial

UKPN Lane Rental Industry Publication



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Introduction

A large amount of small excavation works are carried out per year by utility companies. More pressure is being placed on the streetworks industry to minimise highway occupation and reduce disruption. These evolving requirements and customer demand has led to more customer connection work being requested to take place over the weekend and for fault work to be done as a continuous process (i.e. locate, dig, fix and reinstate). Work has been done to reduce the time taken to carry out these activities along with reducing the adverse effects (i.e. the amount of contaminated soil going to landfill). The reinstatement phase is generally most difficult as, there are a number of factors which impede the time it takes to complete the reinstatement, increases the likelihood of air voids and reduces the general construction performance, which are:

- Multiple trips for different types of material
- Availability of hot asphalt in the evening and at weekends
- Travel and wait time to and at material depots
- Performance of small amounts of transported hot asphalt
- A high degree of wasted unusable material

The ability to have different types of readily available material transported between sites would reduce waste, time and improve performance





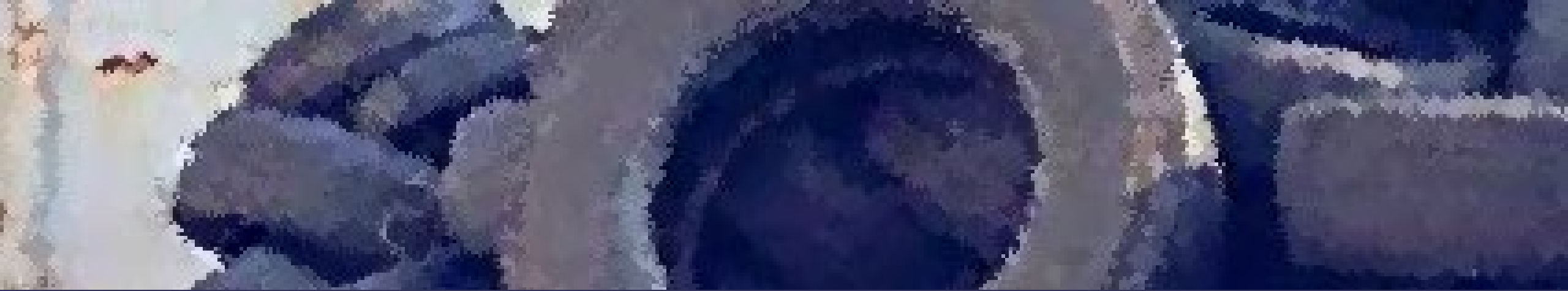
The Trial

The project was to assess bagged bituminous material for compliance with the Specification for the Reinstatements of Openings in Highways (SROH). UK Power Networks commissioned the Transport Research Laboratory (TRL) to assess three different British Standard asphalt materials for specification compliance, durability and long term performance. The materials were provided by Roadmender and mixed using the Roadmender DBP 250 which is a purpose-built mobile asphalt batch plant designed to heat and mix, up to 200kgs of hot-mix asphalt.

During January 2016 a Roadmender asphalt mixer was taken to the TRL where the three materials were mixed and sampled. The sampled material was subsequently compacted with void content values expected in normal service and tested for compliance with the relevant British Standard. To establish the long term performance of the three materials, they were used to reinstate patches at a trial site in Brentwood, Essex. These patches have been visually assessed and the skid resistance values were measured before being cored at 3 and 6 month intervals. There will be further tests carried out on the same basis at 12, 24 and 36 month intervals.

The 200mm core specimens were cleaned on arrival at the TRL and a pendulum skid resistance test was completed on each core in a UKAS accredited laboratory environment. Roadmender mobile asphalt mixer: Roadmender consists of a small mobile asphalt mixing plant mounted on a road going trailer. The asphalt material is supplied as granulated asphalt, with low conventional binder content, in 20kg bags. Additional rubberised bitumen pellets have been added to the material to achieve the specified soluble binder content.

The built-in diesel flame heater is then raised, and the bagged material is emptied into the mixer drum. The heater is then lowered back into position and once the material has been heated to the required delivery temperature the heater is raised and the material is discharged.



Outcomes

The individual material test certificates have been provided as part of this project in a technical report produced by TRL, which is available upon request. In summary, all materials tested met or exceeded the requirements of standard for the HRA, 6mm dense and SMA variants assessed in the programme. A slight anomaly was identified in the grading of HRA and 6mm. By the letter of the BS Standard this does suggest that some samples were marginally non-compliant. The grading envelope that compared the material against was based on the grading envelope for the initial mix design and the non-compliance may be attributable to the inclusion of the pellets. For the crack propagation tests one sample, of the two tested, of both the 6mm and 10mm were out of tolerance. However, on reviewing the BS Standard it does state that the test should be carried out on at least four specimens (compared to the two undertaken) and the original testing presents an average value which does mean that of the samples tested some individual results could be above or below the permitted tolerance.

Lessons Learnt

All three material types tested produced high skid resistance values (>75). While high skid resistance is not a negative attribute, with very light traffic movements in the vicinity of the site reinstatement patches and a surface bitumen film visually evident on the surface of the asphalt aggregate of each material core specimen during the test process, skid resistance values are expected to be high. Subsequent traffic movements should erode the bitumen film and skid resistance values will become an attribute of a combination of the texture depth and the Polished Stone Value (PSV) of the exposed coarse aggregate.

Going forward it would be beneficial to sample the material during the initial batching and again after it has been through the Road Mender to see if the gradings are affected by the inclusion of the pellets. Recommendations for regular sampling of the material as part of the quality control process has been provided, to ensure there is good consistency/repeatability of the material grading. If there were regular occurrences of the material being non-compliant this should be investigated to establish if the initial raw material that is being supplied is at fault or if the addition of the pellets and/or second mixing is introducing the problem.

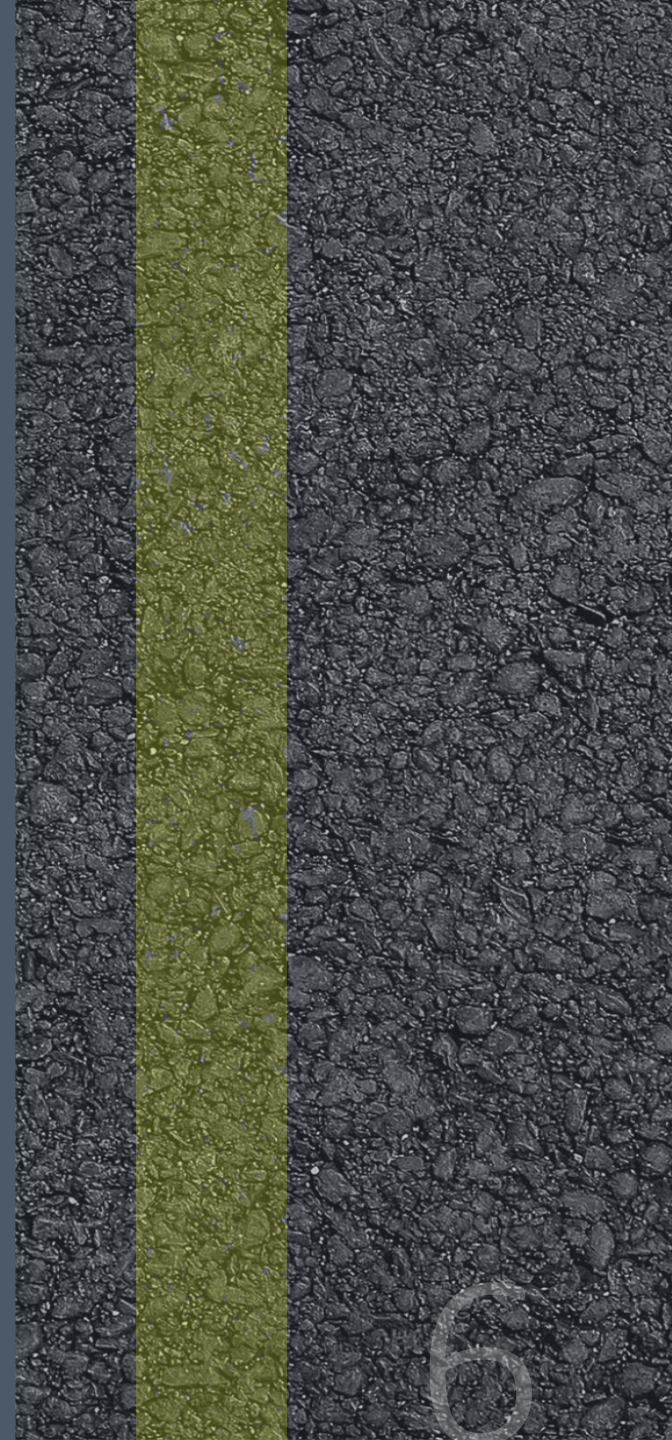


Conclusion / Recommendations

The 3 bagged materials ultimately complied with Appendix 2 of the SROH and BS EN 13108-4 and BS EN 13108-5, plus the Wheel Tracking Performance as set out in PD6691.

The products assessed are all proprietary and have been recommended in compliance with the SROH. The performance of the Roadmender products all meet or exceed the requirements of PD6691 for the HRA, 6mm dense and SMA variants assessed in the programme.

Live operational trials have now commenced in the Kent area using the Roadmender machine and the associated bagged material. Initial findings are positive in that the process, speed and quality of the material is fit for purpose. These reinstatements will be subject to the same testing regime as the off-site trials, with the technical report updated with these results together with the outcome of the tests programmed at 12, 24 and 36 month intervals.



TfL Lane Rental Scheme

Optimising customer journeys through the delivery of safer, innovative and sustainable roadworks



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Date Created: November 2016

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