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TRL670 – New Surface Course Specification in Scotland

M. J. McHale, I. Carswell and P. Roe, Transport Research Laboratory, Wokingham, UK, 2011, ISBN 978-1-84608-965-7, £45·00 (printed) or £35·00 (PDF), 48 pp.

A review of the performance of asphalt surface courses used in Scotland, which was published in 2006, revealed examples of very short service lives and, in some instances, an inadequate provision of early-life skid resistance. As a result, Transport Scotland commissioned a programme of research to improve road surface courses in order to make the surfaces safer and more sustainable. The work included: annual surface course inspections; industry workshops; study trips to Germany to view their stone mastic asphalt (SMA) surface courses; and full-scale road trials in Scotland. The trials comprised eight SMA materials using nominal aggregate sizes of 14, 10, 8 and 6 mm, with four of the trial surface courses being treated with grit to improve early-life skid resistance. This TRL report was prepared for Transport Scotland, an agency of the Scottish Government, and it describes the research and explains how the results were used to develop a new performance-based surface course specification for use on Scotland's trunk roads. The new specification marks a step change in approach for specifying surface courses that, it is hoped, will provide key benefits in improved durability and value for money.

The new specification for surface course was published in December 2010 [Transport Scotland, *TS 2010 Surface Course Specification & Guidance*, Issue 01 (December 2010). See http://mobile.transportscotland.gov.uk/files/documents/roads/TS2010_Ver_01_Dec_10_PDF.pdf (accessed 14 August 2011)]. This new report should be read in conjunction with TS 2010.

This report contains a number of conclusions.

(*a*) A 2006 review of surface courses indicated poor value for money with the open nature of materials and poor joints being of particular concern. A surprisingly wide range of service lives was found, from 'bad' after 4 years to 'still good/excellent' after 10 years.
(*b*) Industry workshops held in 2007 led to the formation of the Transport Scotland Pavement Forum (TSPF) which 'exists to encourage communication between clients, designers and suppliers/contractors and to promote and develop best practice across the road industry'. The group meets quarterly. Its initial findings were very similar to those identified in the definitive TRL Road Note 42 (RN 42) [*Best Practice Guide for Durability of Asphalt Pavements*. TRL, Wokingham, UK], which is unsurprising since one of the authors of RN 42 is the primary author of TRL670.
(*c*) The key elements of the new Scottish specification are listed here.
    (*i*) Strict grading requirements to ensure the correct extent of gap grading.
    (*ii*) Performance-based in-service low-speed skid resistance requirement.
    (*iii*) Addition of cellulose fibres.
    (*iv*) High polymer modified bitumen content.
    (*v*) Maximum air voids contents.
    (*vi*) Gritting all new surfaces.
(*d*) Approval of materials is via a type approval installation trial (TAIT), which has four key stages covering laboratory study, product mix trial, trunk road network trial and final approval by Transport Scotland.

This is an extremely interesting report. On the negative side, it is very disappointing that TRL, normally so commendably precise about terminology, commonly refers to 'surface course' as 'surfacing'. The term 'surfacing' is used for the top two layers in an asphalt pavement, namely the binder course and the surface course [see HD 23/99 General Information which can be found as Part 1 of Section 1 of *Volume 7 Pavement Design and Maintenance of the Design Manual for Roads & Bridges*. TRL, Wokingham, UK 1999].

The report contains some very useful findings. One of the actions emanating from the TSPF is the formation of a panel of 'surfacing experts', designated the Scottish Inspection Panel (SIP), who represent a number of bodies including Transport Scotland, the Mineral Products Association and TRL Ltd. The SIP is responsible for assessing the visual condition of a random selection of sites where surface course has recently been placed. This reviewer remembers witnessing an inspection of a trunk road in England by senior personnel and being impressed by the quality of the outcome compared with that of the surveys normally carried out by untrained personnel (e.g. students during a summer break).

There is no doubt that some pavement engineers will regard some of the findings with a degree of scepticism, such as the fact that there are no texture requirements in the specification and the obligation to take GripTester readings at 4 weeks and 6 months. This reviewer was particularly pleased to see acceptance of the GripTester on trunk roads. This equipment has been under-utilised for far too long.

One question that occurred to this reviewer was why this work is restricted to Scotland and is apparently not being extended to the rest of the UK? Notwithstanding, the next revision to the *Specification for Highway Works* is expected to take on board three key conclusions.

(*a*) That smaller nominal stone size asphalt surface courses can be used safely on high-speed roads with significant noise and rolling resistance benefits.
(*b*) That lower texture depths can be used without compromising safety, a fact highlighted in the report as designers have continued to specify unnecessarily high texture depths, hampered in the rest of the UK by the BBA HAPAS (British Board of Agrément Highway Authorities Product Approval Scheme) system.
(*c*) That the application of grit to the hot surface course is very beneficial in terms of early-life skid resistance, a fact that is common knowledge to the pavement engineers employed by many local authorities.

In conclusion, this report is essential reading for all pavement engineers, including those working outside Scotland, who are interested in surface course performance and characteristics.

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